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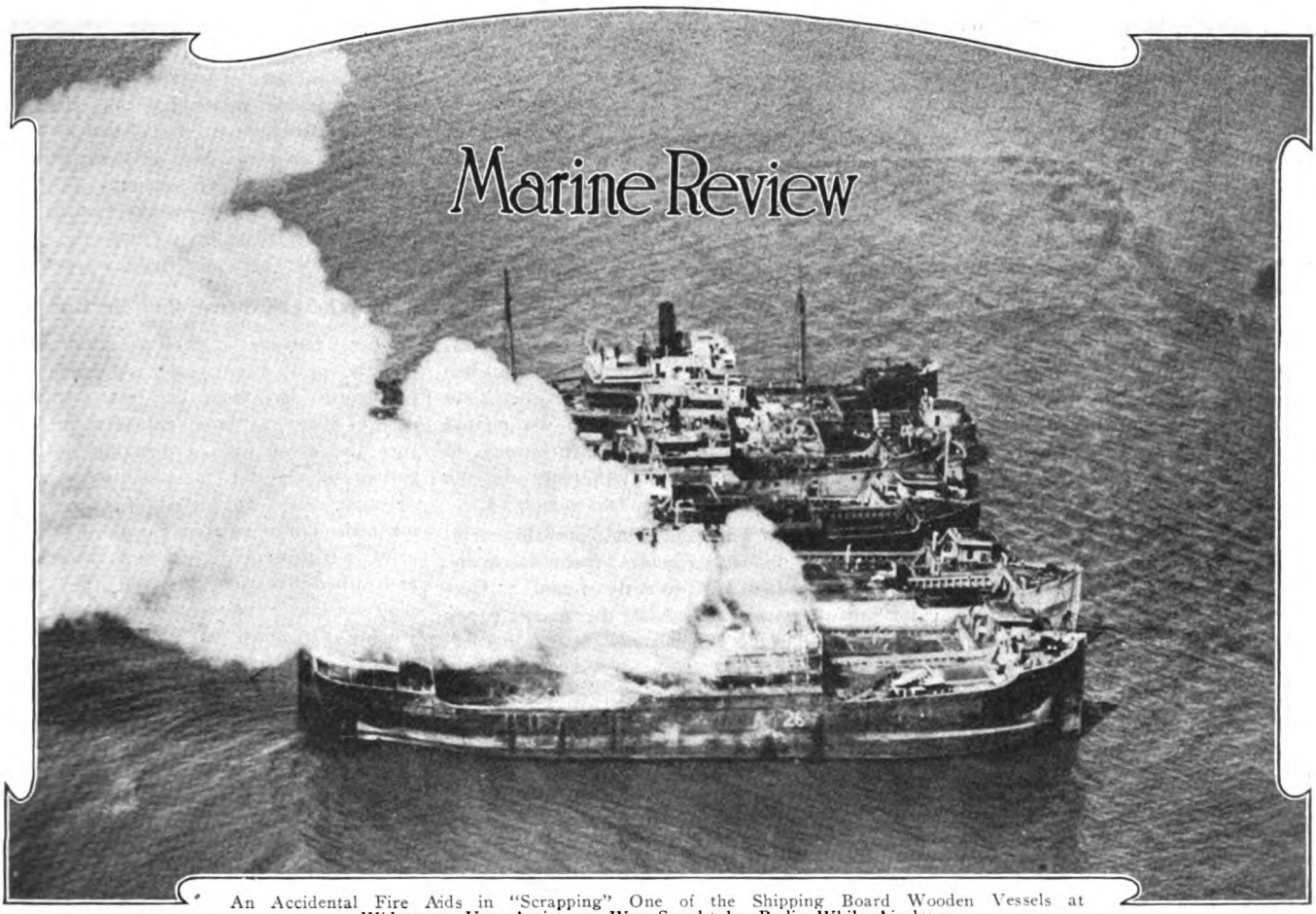



An Accidental Fire Aids in "Scrapping" One of the Shipping Board Wooden Vessels at Widewater, Va. Assistance Was Sought by Radio While Airplanes Hurried to Photograph the Blaze

# Some Plain Facts on Future of American Shipping

BY ROBERT EDWARDS ANNIN

FAILURE of the subsidy bill in the last congress does not create a new situation. It merely emphasizes conditions which have long been known to all experienced shipping men; and the occurrence of which was predicted from the introduction of the "Fletcher bill" of 1915 also known as the "ship purchase" bill. It simplifies the problem of American owners only to this extent, that it proves another of the proposed methods of "restoring the American flag to the seas" to be no thoroughfare. It accentuates one more fact of which this generation at least should have needed no further confirmation—that no commercial proposition is likely to be solved by the injection of politics.

By the experience of the immediate past, government operation, government ownership and private operation and private ownership under direct government aid, have been excluded. From the viewpoint of the government, and of those who desired to acquire government tonnage, "subsidy" was the clear logic of the situation. It seemed a case of "subsidy or quit." The bill was beaten not so much on economic grounds as because it was unpopular. Of real discussion on the merits of the question, there was comparatively little and that not very illuminating. But "subsidy" is a word which has left for many years, a bad taste in the mouth of the American taxpayer.

The world situation as to deep sea business is not obscure. Ocean freights are not low today, as compared with the period of 1901 to 1914. But, what is much more important, they have reached, when compared with total cost of the service, a level at which the margin of profit has been wiped out, on all but the most modern and economical types.

Under such conditions, the position of American tonnage is steadily growing worse, and unless there be a quick change for the better, it seems likely to be driven back to its relative position of 1913. The statement of the department of commerce for the year 1922 is strongly suggestive of this tendency. According to this, the idle tonnage of the world *decreased,* during that calendar year by nearly 2,000,000 tons; while the idle tonnage under shipping board ownership *increased* by 97,000 tons. In percentages, idle American tonnage on Jan. 1, 1922, constituted 48½ per cent of the world's idle tonnage; and on Jan. 1, 1923, it was 59½ per cent.

In such a situation, it will not be enough that Americans introduce absolute economies in management and operation. They must save not only absolutely as compared to present costs, but relatively as compared to foreign competitors. In other words, they must match all the economies of their rivals and in addition, make such special savings as will reverse the tendencies which at present are only too obvious.

Revision of existing laws would accomplish something and might accomplish

much toward the restoration of our merchant marine. A revision is theoretically possible which would almost certainly result in a permanent self-supporting fleet. But such a revision is politically hopeless. The sentiment of "protection" fatally prevents. To protect American shipyards, American repair yards, American sailors afloat, and American workmen ashore, and in fact almost every other industry and group, laws are in effect which prevent building, maintaining, manning and operating American ships as cheaply as can be done by many competitors. And any hope of such revision as would materially change this condition appears very remote.

Thus the problem, stripped of protective verbiage comes down to this: How shall American private owners, unaided by the government, pay more for building, repairing, manning, and operating their ships than any of their chief competitors, and still so successfully compete that the rewards of the business will attract American investment. Clearly this may only be accomplished in one of two ways—either by the practice of economies not open to our competitors or by cutting out avoidable extravagances which now mark American management and operation. As to overhead, higher interest rates and a much higher wage level preclude the hope of any decisive relative saving in that direction. The gain, if any, must be sought in management and operation, or by imposing handicaps on rivals from which our own ships shall be free.

This last, however, which of course looks to discriminating laws, is a more than doubtful expedient. For two can play at that game, and usually do. Therefore, such a course does not offer an inviting prospect of a *relative* gain.

### Wage Costs Are Pegged

In operation, the first point to be considered is wages and subsistence. In a general way, it is realized that this is a point at which Americans are at a disadvantage and this is true. But it does not now appear probable that this handicap is likely to be lightened. Wages on American ships are still perhaps 25 per cent higher than on others, but they are, even then, so unattractive that there is already a scarcity of American sailors in the lower grades. The workman, like the capitalist, turns away from the sea, when he can more easily and safely earn a better living ashore. If the present indications of business revival are realized, it is probable that the American disadvantage in this respect will increase rather than diminish. The same applies to subsistence which is, after all, but a part of wages. As to reduction of crews, that has perhaps already proceeded as far as is wise. And both methods of cutting expense not only can be, but are being, practiced by other nations. British seamen have recently agreed to a cut of one pound per month to aid in meeting German competition. In view of this obvious tendency abroad, the future in this direction is opaque.

The favorite basis for comparison of shipping costs for Americans has been the English standard of expense. An owner who is today operating two similar steamers side by side, one of British and the other of American registry, finds the operating expense of the latter to be about 30 per cent higher than the former. This is based on actual performance. This difference seems to be chiefly due to a difference in the shipping laws of the two countries.

Another important, but probably temporary influence, comes from Germany. The writer has recently found a German steamer on which the master's pay figured about $15 per month and the seamen about $6. This, of course, follows when the German currency is converted into terms of United States gold in which American wages must be paid. On a competing steamer under American registry, the master's wages would be at least $250 per month, and the seamen's about $45. Unless all the teachings of human experience are to be upset, any advantage based on an irredeemable paper currency is bound to be short lived. But—for the moment, and under existing conditions—the menace of the German situation cannot be ignored. How important is its immediate influence may be gathered from the fact that, since 1919, the German mercantile fleet has sprung from below 1,000,000 tons, to 3,000,000 tons, and the port of Hamburg is now again the leading port of the European continent. As long as present conditions continue, one must acquiesce in a statement recently made by an experienced shipowner and operator "So far as cost of ocean transport is concerned, Germany today beats the world."

The fact that only unusual and temporary conditions render such competitions possible is small comfort to those who must immediately face it. The causes are now perfectly evident. The so-called peace "settlement" deprived Germany of most of her merchant fleet which she has been replacing with ships of the most modern and economical type, planned, built, manned, operated and managed at a fraction of the (gold) cost possible to her competitors.

How long Germany can remain on a basis of irredeemable paper is, of course, an interesting question. Nor can the conditions following the inevitable collapse be foreseen. But the present German conditions obviously throw another, and quite superfluous, monkey wrench into the world's shipping machinery.

The deduction from all this is that, so far as sea operation is concerned, no conceivable economies can at present greatly lighten the handicaps of American owners. Nor is there now in sight any method of economy in operation for American owners, which can not be fully offset by corresponding policies on the part of their competitors.

### Where Expense Can Be Cut

There remains a field in which, during the past seven years, American extravagance has been greatest and most deadly—that of shore management. Before the great war, a managing organization which did not habitually work overtime was considered to be overmanned. Office personnel was small, salaries were certainly as moderate as in any allied vocation, and, in the "shipping district" of any large port, the windows gleamed at night—winter and summer. An oldtime operator recently remarked that only 12 years ago, he was handling over 20 steamers under charter, and that his overhead, outside of partners' salaries, was not over $15,000 per annum. This is an unusual record, but in the same period, when business was active, small office forces, small salaries, and long hours were the rule, and everyone in a busy shipping office was expected to be ready for night work six days in the week—and Sunday work was not unusual.

With the war inflation of everything—especially freights—this situation changed utterly. The sudden expansion of business brought into the field a flock of "fly-by-night" operators, who bid wildly for any help that had a technical knowledge of the business. Young men who had been content with three or four thousand dollars a year, were offered positions at two, four or eight times that basis. The inevitable result was a very special and violent advance in managing costs—for established firms had, of course, to protect themselves against the loss of valued employes.

To illustrate the inflation of American managing costs it may be said, owing partly to extravagance, and partly to shipping board regulations, there were few American firms of the "fly-by-night" class that ran at less than $60,000 per annum office expense during and for two years after the war. But in 1920, when freights and expenses were at the peak, the annual report of a Scotch shipowning company showed a total office expense of only £4000 ($19,400) for a fleet which netted £140,000 ($680,000) profit.

With the collapse of the deep sea freights, this situation was largely corrected. But its influence still persists. Economy of shore management has not

yet reached the normal—normal, that is, after allowing for the higher price level which the war has left behind it. This means, for many organizations, fewer men, lower salaries and more work for everyone, from the office boy up—and especially for officers, partners and department heads. This is not pleasant to say, but it seems obviously true; and nothing is to be gained by blinking facts.

Considering the world situation, therefore, it does not appear that, failing government aid—that is subsidy, under whatever name it may be disguised—there is any real hope of restoring the American flag to its old position upon the sea within the lifetime of this generation. Starting from a position of undeniable disadvantage, inevitably arising from the higher cost of every kind of human service; restrained by protective laws from buying ships and labor in the cheapest market, as our competitors may do, we are immediately confronted with the question as to what shall be done with the existing government fleet. Shall it be subsidized, scrapped or sold? Congress negatives the first; it is only human to desire to avoid the second to the limit of possibility; and there would appear to remain only the question of how to sell that portion of the government fleet which is commercially possible.

To sell these ships with the stipulation that they shall be operated under American law, under American government supervision of any kind, or in specified and limited routes, is probably out of the question. The attempts thus far made in this direction have not been encouraging. How, then, may American citizens, who so desire, remain in the world's carrying trade? In the search for an answer to this question, advice has been sought from many sources—among others from builders, operators and owners. So far as now appears, the only clear answer has come from the latter interest. The recent suggestion of the American Shipowners association amounted to this—that such ships as are salable be sold *without restriction* and the remainder scrapped. Thus the menace of an enormous idle fleet, which has hung over the world's market for the last three years would be removed. The words *without restriction* are unqualified and are apparently to be taken in the full sense.

For it is evident that any man who should now desire to become a shipowner with hope of future profit would be logically compelled to buy the most efficient ships at the lowest cost, and operate them as cheaply as possible. Under the American flag this can not be done. The would-be shipowner would therefore turn, by the mere process of economic selection, to those registries which give him the freest hand in all matters of cost. And among these, he would first eliminate American registry as imposing upon him burdens which would render present, or future, success unlikely. As surely as these ships—that is the cream of the shipping board fleet—are sold without restriction, a process of transfer to more economical registry will begin. It does not follow that Americans must get out of the business. There is no law preventing American citizens from owning vessels under foreign registry. And the suggestion of the Owners' association marks its conviction that the time has now come publicly to recognize that, under existing laws, (and failing direct government support) the abandonment of American registry is the only alternative to abandonment of the business itself. Concisely expressed, it means that as conditions now are, and are likely to continue, American law has killed the American market for American ships.

### Chestnut Burrs and Pills

Legislation of the protective class may accomplish certain things. It may prescribe what ships may receive American registry. It may regulate wages, subsistence, quarters and discipline. It may compel the adoption of certain standards, and to some extent control methods of operation and management. But it is beyond the power of congress, the Executive or the courts to compel American capital or labor to remain in the business under conditions which insure loss to themselves. The American owner now feels that purely American conditions result in certain handicaps to profitable ownership; and any attempt to avoid those handicaps is blocked by legislation. Compensation for the burdens thus imposed has been denied him. The difference in overhead and operating costs is too great to be offset by cheeseparing; at which many races are more adept than are Americans.

Even at the lowest ebb of our carrying trade under American registry, American capital was largely engaged in deep sea business. During the decade of 1891 to 1900 freight and passenger business, supported by American capital was active despite a steady decline in American tonnage. The flag was then kept from the seas by the same considerations which are now driving it from the seas. Investors' money followed the line of least expense and greatest profit. And failing a constitutional amendment to human nature, it will probably always continue to do so.

The conclusion to be drawn from all this is that American steamship owners now consider the first and most vital economy in the handling of the efficient portion of the idle government fleet, is to put it under laws which will permit its economical operation and remove its depressing influence from the freight markets of the world. That they have an eye to their own interests in this matter is fairly to be presumed. Nor, when the suggestions of other interests are received, is it to be expected that their basis will be more altruistic. In this as in most matters, the advice of those who know is more or less interested, but the advice of those who are disinterested is of little value. And the important question after all is not how disinterested motives may be, but whether the facts are correctly stated, and the inferences accurately drawn.

For many decades, two schools of economic opinion have struggled with the question of ocean carrying trade. Neither has as yet succeeded in convincing the other. One still considers that trade follows the flag. The other that the flag follows trade. One considers a merchant marine under our own flag a vital necessity. The other believes that the business should go to the nation which most chaeply performs the service.

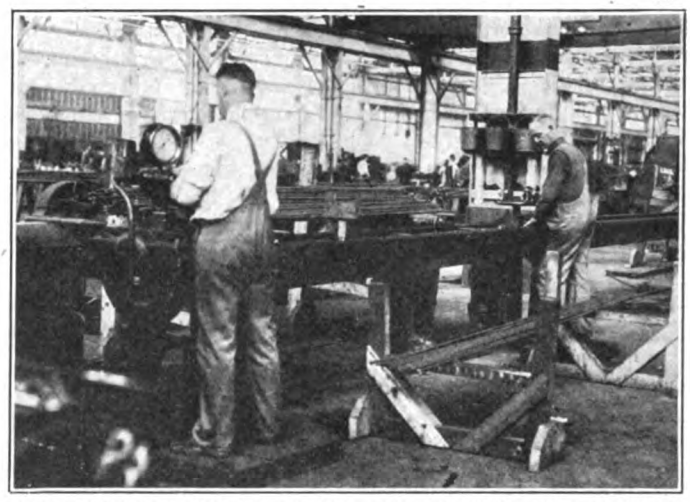
But there is one objection to the proposal of the American Shipowners' association which no one has yet successfully met. However great or small the commercial importance of tonnage under our own flag in peace time, there can be no question at all of its vital necessity in time of war. Should we again be confronted with such a situation as overtook us in 1917, it would be fatuous to expect such aid from abroad as we then received. And in spite of the most lavish expenditure of money and energy, our own ships were only beginning to become a factor when the military situation suddenly turned in our favor in the summer of 1918.

It may be argued that it will be to our commercial advantage to operate our ships under the cheapest flag; or that the question who shall do the carrying trade is not vital, so long as it is well and cheaply done. But it can never again be argued that, once confronted with war there can be either equivalent or efficient substitute for our own ships under our own register, subject to the call of only our own government. This was fully demonstrated in 1917 and 1918 and has been convincingly argued ever since. It is a fair assumption that the subsidy bill was defeated in full view of this consideration.

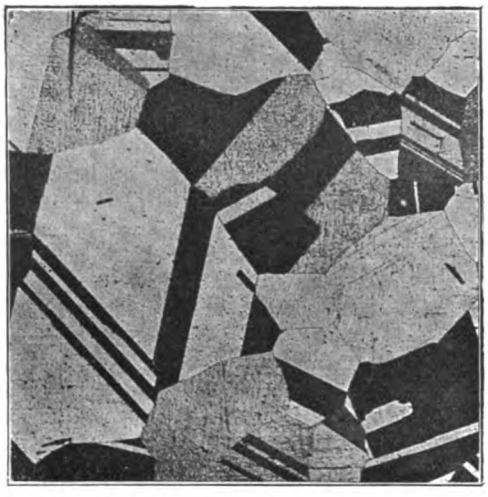
The alternative to the American shipowners' suggestion appears to be some form of government operation.

In matters governmental, all things are possible. But to meet such a situation as now exists in the shipping world, with such a remedy would be like taking a blue pill in a chestnut burr. The pill is bad—there is no help for that. But the burr is impossible.

MICROGRAPH OF HARD ROLLED BRASS

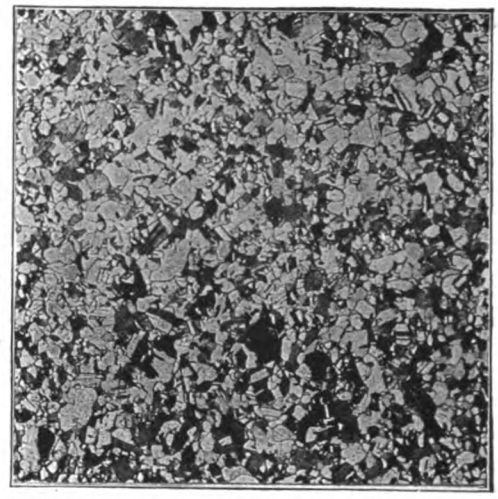


HYDROSTATIC PRESSURE OF 1000 POUNDS PER SQUARE INCH IS APPLIED ON EVERY CONDENSER TUBE



MICROGRAPH OF HARD ROLLED BRASS ANNEALED TO PRODUCE A COARSE GRAIN

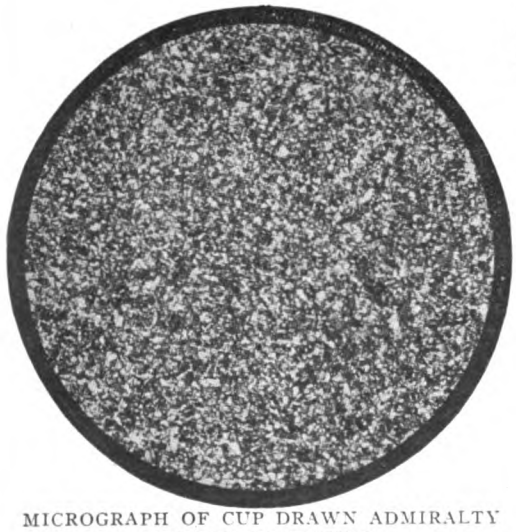
COMPRESSED MUNTZ METAL



MICROGRAPH OF HARD ROLLED BRASS ANNEALED TO PRODUCE MODERATELY FINE GRAIN

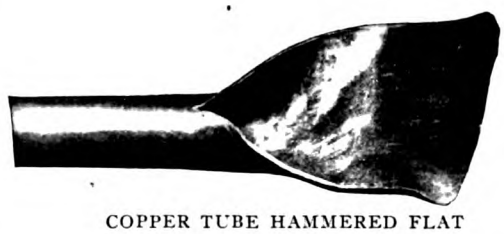
TWISTED ADMIRALTY CONDENSER

COMPRESSED MUNTZ METAL



MICROGRAPH OF CUP DRAWN ADMIRALTY CONDENSER TUBING

TWISTED COPPER TUBING



COPPER TUBE HAMMERED FLAT

FLATTENING TEST

VIEWS OF PRODUCT AND IN PLANT OF MANUFACTURER AT WATERBURY, CONN., MAKING CONDENSER TUBES. SMALL VIEWS SHOW TESTS MADE TO DETERMINE QUALITY OF PRODUCT

# How Condenser Tubes Are Made

## Description of Two Different Methods of Manufacture —Importance and Economy of Using Good Tubes

IN PRACTICALLY every condensing steam plant, tube condensers known as surface condensers are used. On shore, the greatest importance of the condenser lies in utilizing the fullest range of pressure and saving the heat remaining in the condensate, while on shipboard the saving of fresh water is an equally important consideration due to the cost of carrying or making fresh water in large quantities. Fresh water on vessels plying salt water routes is a scarce commodity and consequently proportionately expensive, while on shore it is commonly abundant and cheap.

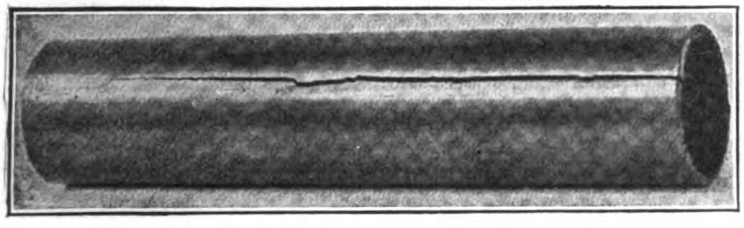
The functions of a marine condenser, whether for a turbine or reciprocating steam engine, is that of an efficient reservoir for the exhaust steam, after it has given to the engine in its last stage, the low pressure cylinder of the reciprocating or the low pressure stage of the turbine, the final energy possible to get out of it as steam, and the conversion of this exhaust steam into hot water. In order to benefit from the lowest pressure of steam, the reservoir into which it is exhausted, that is the condenser, is maintained at the highest practicable vacuum. Taking 29.92 inches of mercury as mean atmospheric pressure, a good vacuum would be 28 inches or an absolute pressure in the condenser of 1.92 inches of mercury which corresponds to approximately 1 pound per square inch.

As the exhaust steam rushes in to the condenser, it must be effectively and quickly cooled off and thus turned into water, which with any air that gets in is pumped out and delivered to the boiler feed system, the air, of course, being removed from the condensate before it ultimately reaches the boilers. From this it will be noted that a condenser must be so built that it will continue to be absolutely tight in order to maintain a vacuum, and that it will serve effectively for condensing the exhaust steam. The usual practice is to have a main condenser and an auxiliary condenser, the first for the main propelling machinery and the second for auxiliaries, such as pumps, dynamo engines and fan engines.

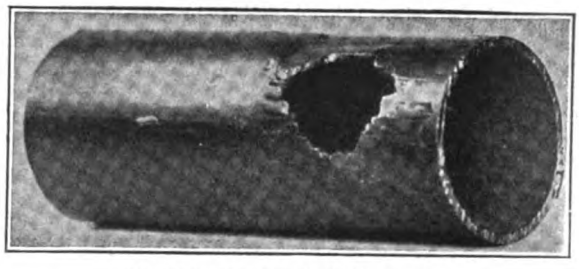
Surface condensers are generally built at the shipyard and the general features are much the same everywhere, only capacities varying with the sizes of the propelling machinery and auxiliaries. A cylindrical shell with ends flanged, either a good quality cast iron or rolled and riveted plate forms the main body. Headers of cast iron are fitted to the ends of the main drum and between these headers and drum flanges heavy circular disks of brass serve to hold the ends of a great many tubes. The tubes are steadied and held in place by a third brass disk fitted inside the main body at about the half length of the tubes. The joints between the main body flanges and the tube end disks are carefully gasketed and the tube ends are fitted with threaded ferrules thoroughly packed. An hydrostatic test is made of the main drum, generally about 30 pounds to determine that there is no defect in the casting or that the riveted shell is tight. A second test is made after completion of the condenser to determine that all joints including ends of tubes in tube sheets and the tubes are watertight. A large opening in the top of the condenser admits the exhaust steam to a space at the top of the condenser free of tubes, where the steam, deflected by means of baffles is brought into contact with the greatest surface possible. Water from the sea is taken in by gravity to a low pressure centrifugal pump and by way of the header is forced through the inside of the tubes in order to condense the steam as it strikes the outside surfaces, the sea water finally passing out and overboard. This is a continuous process tending to keep the temperature of the tubes down so that effective condensation takes place. The number and size of the tubes (length and diameter) is the factor which determines the area of the cooling surface.

Of primary importance then, after full precautions have been taken in obtaining good material and workmanship in the making of the condenser proper is the quality of the tubes. For a salt water job particularly, the greatest care should be taken to get tubes of the highest quality in strength, uniformity and corrosive resistance. The tubes should be free of all flaws and should be as nearly as possible of even gage. Two difficulties are commonly encountered. The first is known as a season crack which is a longitudinal split in the tube due to stresses set up in the structure by improper methods of manufacture. The second is corrosion due to improper proportion of the different metals in the alloy and improper methods of manufacture.

Under the best conditions, the retubing of a condenser is necessary from time to time during the course of the life of the ship. This question is worthy of the active interest of the port engineer in conjunction with the purchasing agent, recommending and buying condenser tubes for replacements and for the representative of any shipowners in the preparation of specifications for a new ship. It is typically one of the many things which enter into the building or repair of a ship in which care based on knowledge will save future expense. Now is the time to apply all possible information to the end that economies may be realized. Therefore, a discussion on the strength and lasting qualities of condenser tubes among other things seems appropriate.



SEASON CRACKED CONDENSER TUBE



CORRODED CONDENSER TUBE

Certain definite features stand out as guides in requisitioning condenser tubes to obtain good results and economy.

1. The alloy known as admiralty (70 per cent copper, 29 per cent zinc, 1 per cent tin) has proved according to unbiased and independent investigations superior to any other.

2. Heat treatment and care in quality and proportion of materials used, the processes of manufacture and proper con-

trol exercised by an experienced and informed personnel throughout the different stages, are all of utmost importance in the production of tubing of the highest quality to obviate any difficulties from splitting, corrosion, and pitting. Though more expensive, the best quality of condenser tubing is decidedly the more economical for the hard service of marine use, corrosion particularly quickly affecting condenser tubing in this field. The recurring expense due to delay, labor, and new tubes, in retubing condensers where tubes have failed, and of equal importance the service troubles resulting from leaky tubes, certainly makes it imperative to seek the best quality condenser tubes obtainable.

# Tubes Made by Cupping Process

A MANUFACTURING establishment, the Scovill Mfg. Co., Waterbury, Conn., founded 121 years ago, is applying to the fullest extent its own long experience in the making of brass products and the latest researches of science to the making of condenser tubes. A thorough study of condenser tube failures was made to avoid mistakes of the past.

The microscope is an important feature in the modern method of studying metal failures and as an indicator of proper proportions of the metals in an alloy and the treatment in the processes of manufacture. The surface of the specimen to be inspected or micrographed is highly polished with the finest polishing material obtainable and is then treated with a corrosive chemical in order to cut away the surface layer and to reveal its structure. Every change in property of an alloy or metal is accompanied by a corresponding change in microstructure. The use of the microscope for a proper knowledge of the condition of any metal or alloy, is, therefore, of prime importance. One view on page 212 shows hard rolled brass worked cold and not heated; another, the same material heated to a moderately high temperature, while a third shows complete recrystallization and coarse grain resulting from a bright red heat. Another shows the microstructure of cup drawn admiralty condenser tubing. Uniform recrystallization and extremely fine grain is evident.

### Failures of Condenser Tubes

Splitting or cracking of tubes in a longitudinal direction, known as season cracks, and corrosion or pitting are the usual causes for failure of condenser tubes. Taking these in order, season cracks are directly due to improper mill methods in the manufacture of the tubes. Cold working of the metal in the process of manufacture sets up excessive unbalanced internal strains which cause fine intercrystallization cracks resulting ultimately in a split tube. Proper heat treatment after each process in the cold working will definitely overcome this difficulty. Impurities in small amounts if introduced during melting will sometimes segregate in such a way as to cause fracture. An excessive amount of gas is sometimes retained in an alloy during melting and gas pockets are formed which will make trouble later.

Corrosion or pitting is in a sense decay, nature's effort to reduce the constituents of the alloy into their natural forms, that is into metallic salts or oxides. This tendency is stronger in some alloys than in others and consequently, to resist corrosion, different alloys have been tried out. For salt water conditions the admiralty mixture is the best. Using the best alloy, care should be taken to avoid the introduction of dross and dirt and unsoundness in the melting of the metal, and proper treatment should be given to produce a fine uniform grain structure.

To conform with the recommendations above for superior results, the actual process of manufacture is of great importance. At the Scovill plant, the manufacture of seamless tubing requires a complete unit consisting of an up-to-date casting shop, a fully equipped rolling mill, powerful cupping and drawing presses, as well as the regular tube mill equipment. Of all alloys developed and proved up to this time, the admiralty mixture (copper 70 per cent, zinc 29 per cent and tin 1 per cent) has proved the best. Great care is taken to use only the purest materials and the proportions are carefully determined by weight.

In melting, precautions are taken to prevent an excessive absorption of gases and the loss of too much zinc by volatilization. The cast bars are trimmed to remove any unsound metal. Samples from each heat are analyzed for copper, lead, tin and iron. Lead and iron exist as impurities and must be kept down to a minimum. Only the metal that conforms to specifications is used.

After having milled the surfaces of the cast bars they are rolled to size and cut into large disks. The disks are inspected on flat surfaces and edges and are then cupped on a press. The cupping operation is itself a severe test and only sound metal will draw into perfect cups. If the metal is imperfect, the bottom of the cups will show checked or will break through. The interior of the tube by this process is just as clean and smooth as the outside and the gage is uniform.

Annealed by heating to a red heat to remove the hardness induced by cold working, the process of redrawing is continued to a point where a great length of cup is produced. The cup is then completed on the draw bench. Every annealing operation is carefully controlled by indicating and recording pyrometers and at regular intervals, samples are examined under the microscope to check up the heat treatments. The hard drawn tubes are finally heat treated to produce a fine uniform grain. Finished tubes are straightened, cut to length, inspected inside and outside and gaged for size and uniformity of thickness. A hydrostatic test of 1000 pounds and an air pressure of 80 pounds is applied to each tube. Compression and flattening tests are also made.

The fine, dense structure, and the fact that the metal is in itself uniform throughout is sought to insure the greatest resistance to corrosion. The tube has rigidity but at the same time is so ductile that it can be flattened upon itself without cracking. It will stand a great degree of expansion and can be twisted without showing strain. The method seeks to eliminate season cracking through obtaining a high degree of elasticity and freedom from drawing strain.

### Extrusion Process

Special muntz tubing is manufactured with the same care but by entirely different processes. A large billet is cast and trimmed to remove casting defects. Sections are cut off and heated to redness and by means of a hydraulic press are extruded through a die into the form of rods. After inspection, these rods are cut to length and are again heated red hot and then pierced on a machine, and so made into heavy gaged shells which are then drawn down into tube sizes on the regular draw bench. The double hot working treatments are said to impart exceptional physical properties, refining the structure and making it more dense. Fine uniform grain structure nearly identical with that for the admiralty tubing is obtained.

All physical tests as required for admiralty condenser tubes by the United States navy can readily be met by this special muntz. It has high resistance to corrosion but does not equal the admiralty alloy in this respect.

# Tubes Made by Cast Shell Process

EVEN a cursory glance into the literature covering the present day knowledge of the properties of alloys of copper, zinc and tin indicates at once the vast amount of scientific and practical experimentation which has been carried on for years in an intelligent and energetic manner by the leading manufacturers of brass products in the United States. The goal of all these investigations has been the development of alloys and processes of manufacture to give a product that will best withstand the conditions of service under which it is to be used and at the same time to keep the cost of production as low as possible and always within practicable limits. In this development, the Bridgeport Brass Co., Bridgeport, Conn., occupies an enviable position for its original active and intelligent scientific and practical investigations.

### Essentials for Good Tubes

The object of the present article is to give to the users of marine condenser tubes correct information based on the knowledge and experience gained by the above manufacturer in more than 30 years. The illustration on page 216 shows various interesting stages in methods of manufacture at this plant. In order to emphasize certain outstanding features, the various factors which enter into the making of a good quality condenser tube should be understood:

1. The choice of proportions of the metals, copper, zinc and tin.
2. The careful maintenance of the proportions chosen and the elimination of impurities.
3. Melting and pouring of the alloy.
4. Condition of molds and cores to produce a perfect casting.
5. Annealing and pickling at various stages of manufacture.
6. Inspection and testing to eliminate imperfections.

All manufacturers of condenser tubes and the foremost authorities on the use of this product have agreed that the best known alloy so far developed for severe conditions of use is that known as the admiralty, that is, copper 70 per cent, zinc 29 per cent and tin 1 per cent. In practice, it is impossible to keep out a very slight amount of lead and iron but these metals must be limited in amount to the lowest point possible and the maximum for the two together should not exceed 0.135 of 1 per cent.

At the Bridgeport Brass Co., the different metals after classification by systematic analysis are weighed into the charging cans, each metal by a separate workman. Before being sent to the casting shop, the complete charge is weighed and this weight must check the sum of the component parts. When the metal is ready to pour, a sample is taken of each melt and the results of the analysis of this sample is ready before the casting goes to the mill to be worked into the finished product. By this method, complete and accurate control of the ingredients is maintained. The processes of melting and pouring are scientifically and definitely controlled by the use of electric furnaces. Temperatures of the metal at different stages are known and can be controlled mechanically within exact limits and are not subject to the variations sure to result when left to the judgment of the operator, and furthermore the temperature distribution is uniform. Stirring and mixing is more thoroughly accomplished by the use of these furnaces than could be done by hand. Purity of the metal is insured by the furnace chamber being entirely closed except when charging or skimming.

In making admiralty condenser tubes at Bridgeport the cast shell process is used. Great care is taken in making the cores. A fine grade of core material is applied to a perforated steel pipe in successive layers allowing for drying between each application. After the final coat has been put on and after it is completely dry, the core is rubbed down to a uniform size and then given a coat of whiting which fills the surface making a sort of enamel finish. With the use of this core and keeping the interior of the molds properly lubricated by swabbing with a heavy oil, smoothness of finish and texture in the castings is produced.

After thoroughly cleaning each cast shell, it is annealed and then pickled to remove all scale. When the cast shell comes out it is clean and bright both inside and out and is then inspected for any surface flaws. It is next put through the first draw, after which it is annealed and pickled and the process of drawing repeated a second time, after which each tube is again inspected for minute surface inperfections which as found are removed by the use of a special milling cutter. The annealing is of the utmost importance and the temperatures are carefully controlled by electric pyrometers, both indicating and recording. This process of drawing, annealing and pickling is repeated until the required outside diameter and gage is obtained. The tube is then straightened by passing through rollers, cut to length and ends chamfered inside and out. Samples are taken from a certain percentage of all tubes manufactured for analysis and tests in the laboratory. Each finished tube is then tested at 1000 pounds hydrostatic pressure and then finally inspected before shipment.

From the above, it will be noted that scientific knowledge, practical experience and careful supervision is applied to the manufacture of admiralty condenser tubing at every step, in the cast shell process.

### Main Cause of Failure

From many years of experience in making condenser tubing, W. R. Webster, vice president of the Bridgeport Brass Co. and in supervisory charge of the laboratories and the technical control of the manufacture of the company's products, is of the opinion that of the numerous reasons for the failure of condenser tubes, a great part are traceable to the design and construction of the condenser and the condition under which it operates. Water polluted by sewage or other impure foreign matter will seriously affect the life of the tubes. The tubes should be cleaned periodically as any foreign matter which lodges and stays in one place forms a source and center of decay. Water velocities, radical variations in temperature, continuous and intermittent service all have their effect on the life of the tubes.

Fundamentally, however, no matter what the subsequent service of the tube may be the manufacturer should turn out a tube that will best resist corrosion, cracking and disintegration under the most severe conditions of service. In the first place the proportions of the different metals in the alloys is all important. The question as to whether one type of admiralty tubing is better than another will rest entirely on the care with which the processes of manufacture from start to finish are carried out and the certainty with which proper control is maintained at all stages.

Both users and manufacturers of condenser tubing would benefit if a certain definite standard was set up. The American Society for Testing Materials has prepared a tentative draft of specifications covering admiralty condenser tubing and have invited criticisms and sug-

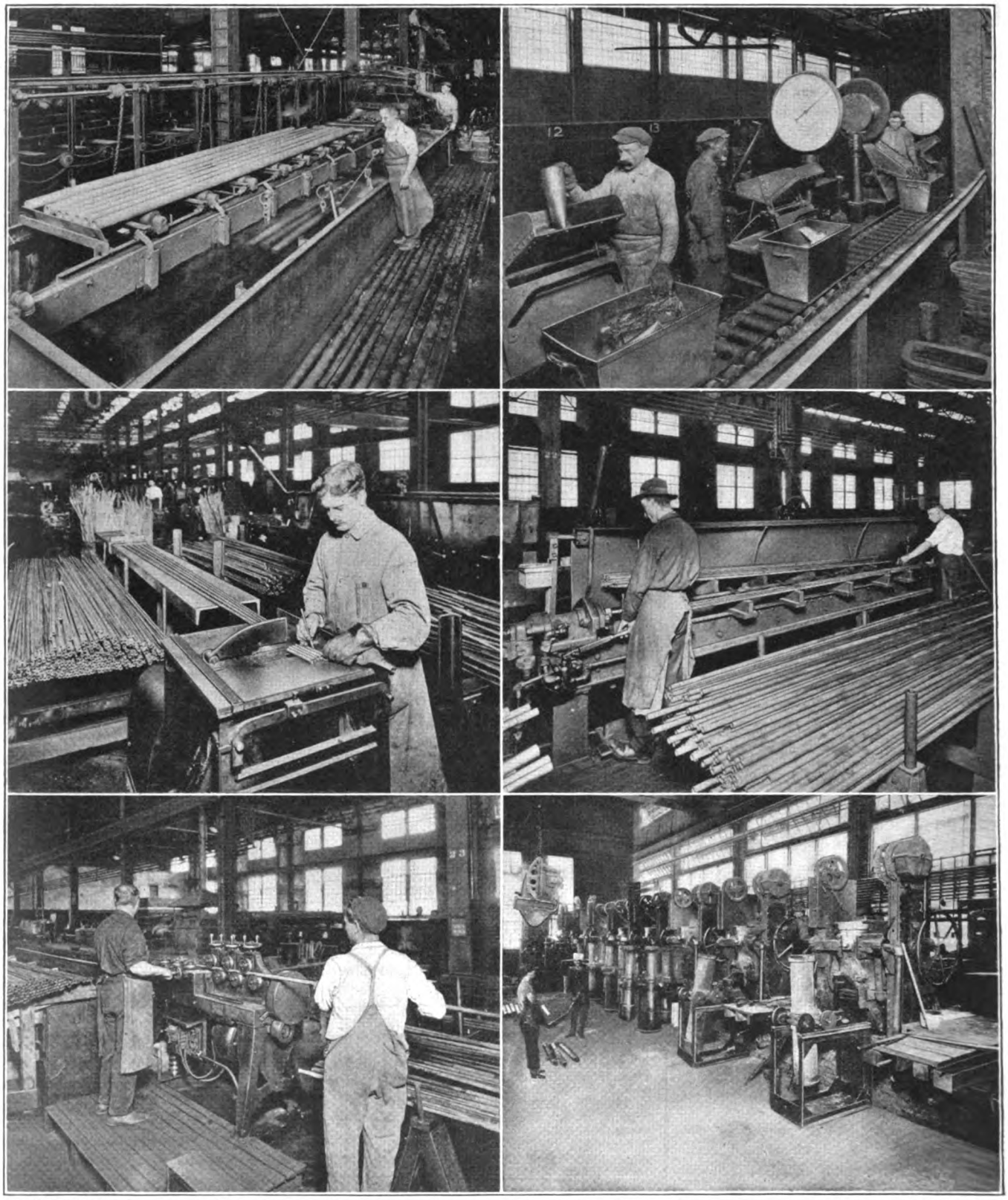
## World's Largest Ships

LEVIATHAN (American)—Gross registered tonnage, 59,956.65; overall length, 950 feet 7 inches; beam, 100 feet 6 inches.

MAJESTIC (British)—Gross registered tonnage, 57,100; overall length, 956 feet; beam, 100 feet.

IMPERATOR (British)—Gross registered tonnage, 52,226; overall length, 882 feet 9 inches; beam, 98 feet 3 inches.

gestions. When these standard specifications are finally promulgated, they will be broad and comprehensive and serve as a useful guide for users of condenser tubing insuring a good quality product and at the same time allow the manufacturers to standardize their processes and eliminate making tubes to many different individual specifications of more or less uncertain merit. It is only by such methods that uniform quality as far as manufacture can be assured.



MANUFACTURING CONDENSER TUBES AT BRIDGEPORT PLANT. (TOP, LEFT) BATCH OF TUBES ISSUING FROM CONTINUOUS ANNEALING FURNACE AND READY TO BE DUMPED INTO PICKLING SOLUTION. (TOP, RIGHT) CAREFULLY WEIGHING INGREDIENTS OF AN ALLOY, EACH MAN WEIGHING ONLY ONE CONSTITUENT AND THUS HAVING ONLY ONE WEIGHT TO REMEMBER. (CENTER, LEFT) SAMPLING CONDENSER TUBES FOR INSPECTION TESTS, A CERTAIN PERCENTAGE BEING THUS TESTED IN THE LABORATORY. (CENTER, RIGHT) HYDRAULIC TEST OF CONDENSER TUBES. (BELOW, LEFT) STRAIGHTENING CONDENSER TUBES, THE ROLLS SPRINGING THE TUBE AS WELL AS STRAIGHTENING TO EQUALIZE ANY MECHANICAL STRAINS FROM THE LAST DRAWING. (BELOW, RIGHT) POURING OF A BATTERY OF ELECTRIC BRASS FURNACES. THESE FURNACES GIVE ACCURATE TEMPERATURE CONTROL

## Ocean Trade at Boston Continues Heavy

Imports at Boston continue heavy, but exports have fallen off somewhat during the last few weeks due largely to the opening up of the St. Lawrence river and the resultant transfer of western grain shipments from Boston and Portland, Me., to Montreal.

Freight arrivals at Boston are so far in excess of shipments that vessels almost invariably have to touch at another port to complete outgoing cargo. This is not true of coast to coast traffic which is exceptionally heavy in both directions. Railroad traffic conditions at Boston have greatly improved during the past month and the excessive congestion of the winter has entirely disappeared.

A new service between Boston and Philadelphia with two sailings a month is announced by the Burton Steamship Co. Special sailings have recently been made from Boston to many ports including Hamburg, Bermuda and San Francisco. Operators of coastwise vessels report that the charter demand is greatly improved in that trade. Recent charters have covered shipments of ties from Bermuda to Boston and bituminous coal from Hampton Roads to the various New England ports.

# Fighting a Fire in a Cargo of Sisal

BY COLIN McKAY

WHAT should a shipmaster do in case of fire in a cargo of hemp? Lift his hatches and try to deal with it directly, or keep on his hatches, close his ventilators and all other openings and try to smother the fire with live steam.

The following yarn of how one shipmaster attempted to deal with the problem may be of interest; and it may serve a good purpose if it leads others to relate their experiences with fire at sea.

Captain Bates, as I shall call him was a fine type of the British shipmaster. He held an extra master's certificate, and had sailed all kinds of craft from full rigged ships to passenger liners. During the war he had a rather exciting career and finally went down with his ship, sunk by a submarine.

### Fire is Discovered

A dozen or more years ago he was in command of a 5,000-ton steamer, trading to Mexico. I was then second mate with him. On the trip we had the fire, we loaded sisal, or Mexican hemp, at Progreso. We had frequently handled this cargo before, and while loading always had notices posted up forbidding smoking on deck. The stevedores were very strict with the longshoremen who knew very well that smoking below would endanger their own and their fellow's lives, as the dry fiber blazes up sometimes like gunpowder.

We loaded from lighters about three miles off the beach, and as a "norther" on the Yucatan bank is not pleasant, usually worked steadily until finished. We had four officers and two cadets, and there was always an officer tallying the bales going into the two hatches forward and another officer looking after the two hatches aft. Incidentally the officers took note of anybody violating the rule against smoking on deck. This trip, the ship's surgeon was fined, much to his indignation, as he had not been near the open hatches.

We left Progreso about midnight, and 48 hours afterward when a man came to the poop to call me for the middle watch, he said there was a smell of smoke about the after deck. I told him to put his head in the ventilators. By the time I had my clothes on he was back, saying there was fire in No. 3 hold.

### How to Fight It

I went along myself, sniffed at the ventilators leading to No. 4 hold, smelt nothing, and then tried the ventilators leading to No. 3 hold. I smelt smoke or some kind of gas, but couldn't see anything emerging from the ventilator.

"Call the mate and all hands," I said, "And tell the watch to come along with the storm covers of the ventilators."

I turned the cowls of the ventilators back to the wind, and went along to the old man's cabin near the bridge.

"There's fire in No. 3 hold, sir," I said knocking on his door. "All right, I will be out in a minute," he answered calmly, instantly awake. Going aft again I was soon joined by the watch, and we lifted off the cowls of the ventilators and put on the storm covers which were water proof if not airtight. Then I told the men to hustle along the deck hose and some electric light clusters and notify the engineers.

The steamer was then plowing up the gulf stream about abreast of the last of the Florida keys; running along under a starlit night over a sea scarcely stirred by the light easterly breeze.

Captain Bates and the mate soon appeared and when the deck hose were laid and the electric clusters shining, a corner hatch was lifted. A whitish smoke hung in the hatchway, but there was no glimmer of flame. Presently the smoke began to ascend lazily, and we closed the hatch again.

The old man was undecided for a while. He talked it over with his mates and engineers. Some thought it would be best to try to locate the fire and exfinguish it with the hose; others believed it would be safer to keep the hatches battened down and rig up a pipe to introduce steam into the hold. But nobody could offer a really authoritative opinion on the question, though that ship had more than the usual quota of master mariners and chief engineers aboard. The thing was simply outside their experience and the range of their studies and general reading.

Nobody was alarmed or even excited. We were piqued by curiosity —curiosity as to the origin of the fire and its possible outcome; but that fire might have been in Mexico, instead of under our feet, for all other emotions it caused. The bosun, carpenter and others whose night rest had been disturbed were obviously bored.

### Starting the Fight

The old man's position was difficult enough. If he opened the hatches the fire might be fanned by the inrushing air to a disastrous blaze. If he kept on his hatches, it might still smoulder and do a lot of damage, and the owners and underwriters might ask why he did not fight it directly. In the end, the need of action, of being able to say that he had grappled directly with the danger, that and curiosity—the desire to probe the mystery beneath the blanket of smoke and to know the worst—decided him to try to get at the fire.

We took off the hatches and the smoke soon cleared away. In the upper 'tween deck there was only

one layer of sisal bales. On the port side was the refrigerator chamber and on the starboard side a magazine extending the length of the hatchway. When we ventured below we found that a thin trickle of smoke was oozing from the crack of the magazine door, but there was no sign of smoke or fire anywhere else.

We rigged up the derricks and removed the single tiers of bales, which weighed about 250 pounds, from the 'tween deck hatch, stowing them in the empty space farther aft. Then we got a spare tarpaulin, wet it, and laid it over the hatches of the 'tween decks with one end forming a carpet to the door of the magazine.

Opening the door of the magazine we saw no sign of flame, and the amount of smoke that came out was insignificant. But it was enough to indicate the presence of fire.

We began to hoist the bales out of the magazine and up on the main deck. Some showed signs of fire—slight scorches on tufts of fibre—and when these were opened on deck they usually burst into flame, as if the fire had been smouldering in the tight packed heart of them. The deck hose soon extinguished the flames.

We kept a careful watch for the beginning of a blaze in the magazine, and, because of the acrid gas which hung inside, used relays of men working there. But we had no blaze below, though a dozen scorched bales when opened on deck burst into flames.

After two hours hard work, we cleared the magazine, and then rolled away the tarpaulin and lifted some of the 'tween deck hatches to look at the bales below. No sign of smoke, no smell of fire. We went on deck.

Captain Bates was smiling broadly, and everybody was in high fettle. Grog was served and we congratulated ourselves on a fine night's work.

"Put on the hatches the watch, the rest can go below," said the mate.

While I was going toward the bridge to relieve the third mate who had been there six hours the ship was suddenly enveloped in a great flare of light, and turning aft I saw a great geyser of flames rising from No. 3 hatch, shooting up as high as the eyes of the main rigging.

After a few minutes the bonfire died down, having eaten up the air in the hold, but the flames continued to billow in the hatchway. Three streams of water were turned into it, and we started to put on the hatches. Several times the flames soared high, but we finally got the hatches on and the tarpaulins spread, with the three lines of hose under them, so that the water would run between the interstices of the hatches and down on to the fire.

We were astonished and annoyed. "Well, I would never have believed it if I had not seen it," said the old man. 'If that infernal blaze had burst out when the men were below—" He turned to pacify a number of excited passengers who had been aroused by the flare of light shining in their stateroom windows.

### Overcome by Gas

The steamer plowed up the gulf stream, bilge cocks open until there were 12 feet of water in No. 3 hold. Then she took an ugly list and the pumps were started until she righted again. The engineers broke a joint of the steam pipe leading to the after winches and connected it with a pipe introduced into the hatch. Several carboys of ammonia were taken from the refrigerator plant, and thrown into the hold with their cap valves open. When a hatch was raised for this purpose the flare of fire was visible.

The steamer headed for Newport News, with the water from three lines of hose pouring through her hatches and a pipe throbbing with the pressure of steam rushing into the hold. We watched the hatch and the deck temperature, and kept an eye on the ventilators of No. 4 hold, fearing the sisal there would be fired by the heat of the bulkhead.

The morning after the discovery of the fire, the second steward went into the refrigerator chamber for the day's supplies. He dropped at the foot of the ladder. Another steward went and he dropped. A cry of alarm brought an officer who realized that gas from the fire had got into the refrigerator. The unconscious men were fished out. The doctor had a job to bring them around, and they were very sick for a few hours. We had no fresh provisions that day.

About three days later we anchored at Newport News, and two fire tugs and a lighter came alongside. The fire tugs pumped water into the hold until she took a list. Then we began to discharge the sisal into the lighter, where the bales were broken open.

An in spite of water, ammonia and steam, hundreds of bales had fire in the heart of them and blazed up as soon as opened. Even some of the bales which were under water when the lower hold was flooded had fire in them.

An authoritative explanation of the fire was never forthcoming. It was conjectured that the heat of the engine room bulkhead might have caused it, but the ship had carried a dozen or so cargoes of sisal without mishap. During the fire, the deck became rather hot and presumably the after bulkhead too, but there was no trouble in No. 4 hold. Possibly it started from spontaneous combustion, but if so, it was an exceptional occurrence.

The actual amount of sisal burned was insignificant. While the fire ran along some fibers like powder, it ignored others. Apparently when it found a fiber to its liking it ran right into the heart of the bale in preference to burning its neighbors. And possibly the penetration of the water through the apertures the fire must have made, was interrupted by the swelling of the fibers. But how the fire managed to smoulder in the heart of bales completely soaked on the outside is a mystery.

# Make First Contour Map of Ocean Bed

THE bathymetric chart of the west coast of the United States from San Francisco to Point Descanso, Mexico, hydrographic office chart No. 5194, just published by the hydrographic office of the navy department, is the result of a survey using the sonic depth finder conducted by the U. S. S. HULL and CORRY at the request of the Carnegie Institution of Washington.

Dr. H. C. Hayes, Ph. D., of the experiment station of the bureau of engineering, navy department, in June, 1922, completed the development of an apparatus for obtaining ocean depths by an instrument called the "sonic depth finder." Dr. Hayes clearly outlined the principles and operation of the depth finder in MARINE REVIEW in September, October and November, 1921 and October, 1922. Successful tests were made and excellent results were obtained with this apparatus by the U. S. S. STEWART on a voyage from Newport, R. I., to Gibraltar, and from Gibraltar to Manila, P. I.

The design of the sonic depth finder is based upon the theory that a sound impulse emanating from a point near the surface of a body of water will be reflected back to that point by any submerged surface within its range of propagation. This theory applies par-

ticularly to the sea bottom. All that is necessary is to know the velocity of sound in water and to perfect some method of accurately measuring the time from the moment the sound is produced till it is heard again reflected back. This accurate measurement of the time interval is now perfected.

A vessel equipped with some form of sound transmitter and receiver, passing over a sea bottom of great depth, theoretically may use this apparatus to measure the depth approximately by sending out an impulse with the transmitter and measuring with a stop watch the interval of time elapsing until the echo of that impulse is heard in the receiver. Assuming the velocity of sound in water to be 4,800 feet, or 800 fathoms, per second, the distance the sound travels to the sea bottom and back will be equal to the number of seconds as shown by the stop watch multiplied by 800 fathoms. The depth is, of course, one-half this amount. The human error, however, in starting and stopping the watch makes this method inaccurate.

As a result of lengthy experiments, the navy's sound experts have devised an indirect means of measuring the time interval which produces results correct within 0.005 per cent. This device is based upon the principle that if sound impulses are sent out at various known intervals, some one of these intervals will agree with the lapse of time necessary for the sound to travel to the bottom and back to the receiver.

The final design of the sonic depth finder, based upon the theory just stated, consists of:

(a) A continuous speed rotary converter controlled over narrow bands of speeds by a tuning fork.

(b) A disk of 10-inch radius rotated at slow speed by the motor of the rotary converter.

(c) A shaft upon which the rotary cams are mounted and which carries a friction wheel which can be adjusted to rest at any radius on the rotating disk.

(d) Keys which are operated by the cam wheels for sending sound-transmitter signals.

(e) Inductive coupler for connecting one phone inductively to the sound-transmitted circuit.

(f) Necessary wiring to connect opposite phone of the head set to sound-receiving apparatus.

(g) A divided head telephone set of low resistance.

(h) An adjusting screw for the friction wheel, having a micrometer scale.

To operate this device, let it be assumed that the vessel equipped with the device is passing over a bottom which is 400 fathoms deep, and that the disk of the sonic depth finder is set in motion with the friction wheel in such a position that an impulse is sent out once in every 1½ seconds. The first impulse sent out will be heard in one phone of the head set while the key is closing the transmitter circuit; and when the key again closes the circuit 1½ seconds later the sound will be heard in the same phone (or ear). In the meanwhile the first impulse has traveled to the bottom and back, a distance of 800 fathoms in all (twice the depth), and as the velocity of sound in water is 800 fathoms per second, the sound is heard in the opposite phone of the head set one second after it was transmitted, and one-half second before the second impulse is transmitted. The operator then knows at once that the time interval of 1½, for which the device is adjusted, is too great, and will reduce the interval by moving the friction wheel which operates the cam shaft to a greater radius on the disk; and, by thus increasing the speed of the cam shaft, the time interval will be decreased accordingly. As the adjustment of the friction wheel position is continuously variable, the time interval can be reduced until it coincides exactly with the lapse of time between making the sound impulse and the reception of its echo, which in this assumed case will be one second.

### Value of Knowing Ocean Contours

For measuring water of depths greater than 50 fathoms up to such depths as are encountered in midocean, it is necessary to use with the sonic range finder a high-power vibratory sound transmitter and also a directional form of sound receiver.

The soundings obtained by the U. S. S. STEWART with the sonic depth finder showed that the contours of the ocean bottom could be charted with this device, and these important developments made it possible for the HULL and CORRY to obtain the depths of water necessary to construct the new chart, which data will be of great value to seismologists, geologists, and oceanographers.

Contemporaneously with the development of the sonic depth measurer, seismological societies in the United States were making a study of the earthquakes on the west coast of the United States. To study the earth movements in California, it is necessary to know where the zones of structural weakness are. Some of these can be plainly seen, others of them can only be found by inference from the adjacent geological structures. Knowing where the zones of weakness are located, it then becomes comparatively easy to discover both the source and the direction of progression of underground movements.

In connection with this study of earth movements in California, there was prepared for publication by the Seismology Society of America, with the co-operation of many different agencies, a fault map of the land area most liable to earthquake disturbances on the west coast. As the observations in 1922 accumulated and the map grew, it became clear that many of these faults led to the seashore and no doubt continued beneath the sea.

The Carnegie Institution of Washington, having learned of the sonic depth finder developed by Dr. Hayes, requested the hydrographic office, which has charge of naval surveys, to have soundings taken off the coast of California with this new apparatus. The navy department, desiring to be of every possible assistance in furthering this important scientific research, fitted out the U. S. S. HULL and CORRY with the sonic depth finder.

The sounding operations were commenced in November, 1922, and parallel lines of soundings, were run on courses 240 degrees and 60 degrees (true) from the 100-fathom curve to the 2000-fathom curve. The lines were run 10 miles apart from San Francisco to Point Conception, and 5 miles apart from Point Conception to Point Descanso, Mexico. The average distance between soundings on each line is 2 to 2 miles; the distance covered was 5800 miles and the area covered 34,000 square miles. The vessels steamed at 12 knots speed and completed the survey in 38 working days, obtaining approximately 5000 soundings.

The observations obtained by the survey of the HULL and CORRY has permitted the construction of a contour map of the ocean floor by the hydrographic office from the coast line to a depth of 2000 fathoms—12,000 feet. This is the first successful contour map of a zone of deep-sea soundings ever made. The chart represents the configuration of the ocean floor in the region, showing the submerged hills, valleys, cliffs, and precipices. The recent earthquake in Chile suggests that the undersea portions of coastal faults may be most active and dangerous.

It is perfectly clear from the contour map that a number of very steep slopes or cliffs have been located, some of which may be fault scarfs of considerable elevation. The indications are that the chart also locates the so-called "continental shelf," which is commonly thought of as representing the structural demarcation between a sinking ocean bed and a rising continent.

The future study of the inaccessible ocean depths appears now to be of high precision.

Regions in which changes occur frequently, such as the coast of Chile or the Hawaiian island group, can be studied with great care and detail, and the direction in which future displacement may be expected can be ascertained.

## Growth of Insular Trade

Of great interest to shipping is the statement compiled by the National City bank, New York, on the growth of insular trade pointing out that there has been in the past 25 years a total trade in imports of $3,360,000,000 as against $502,000,000 in the 25 years prior to the Spanish American war. The trade in sales to the various islands in the same period amounted to $2,038,000,000 as against $134,000,000 in the 25 years prior to occupation. A large portion of the imports of all these islands are supplied by the United States as follows: Sixty-five per cent of those of the Philippines and over 90 per cent of those of Porto Rico and Hawaii. Of the exports, the United States takes 60 per cent of those of the Philippines, 90 per cent of those of Porto Rico and 95 per cent of those of the Hawaiian group. The principal commodities are sugar, tobacco and manila hemp as imports from the Philippines, sugar and pineapples from Hawaii and sugar, tobacco and tropical fruits from Porto Rico. In exports, manufactured articles of all sorts and some food, especially flour and meats, are sent to the islands. The amount of shipping necessary to carry this trade points again to the real need of an American merchant marine.

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The liner COLUMBUS, now under construction for the North German Lloyd, reveals the efforts of the German shipowners to regain their former strength in transatlantic passenger trade. The COLUMBUS will be 780 feet in length, 83 feet beam, 44,000 tons displacement, 32,000 gross tons with 28,000 horsepower and a speed of 20 knots.

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## Book Review

*Hendricks Commercial Register of the United States;* cloth; 2482 pages, 8½ x 11½; published by the S. G. Hendricks Co. Inc., and for sale by MARINE REVIEW; price $15.

This register has now reached its thirty-first annual issue. The present volume, as in earlier editions, covers a wide range of industries and lists the manufacturers of equipment under many headings, including electrical, engineering, machinery, building, manufacturing, chemical, hardware, iron and steel, railroads, mining, etc. Dealers, manufacturers, producers and consumers are registered.

More than 18,000 products are classified separately in this edition, with the names and addresses of the manufacturers appearing in alphabetical order under each classification. Trade names and brands are given, a separate section also listing these names alphabetically and giving the name and address of the manufacturer. All manufacturers appearing in the register also are listed alphabetically in a separate section.

Primarily the book is intended to be a guide for buyers and sellers and the descriptive information of products and services is arranged to facilitate the prompt location of sources of and outlets for finished materials.

## Complete New Danish Motorship

The motorship ARIZONA recently was built for the United Shipping Co., Copenhagen, the hull being constructed by the Nakskov shipyard, Nakskov, Denmark, and the machinery built, delivered and installed by Burmeister & Wain Ltd., at their yard in Copenhagen. The principal dimensions and other particulars of the vessel are:

| | |
|---|---|
| Type of ship | Cargo |
| Length b.p., ft., in. | 405 |
| Breadth, molded, ft., in. | 54 |
| Depth., ft., in | 36' 6 |
| Draft loaded, ft, in. | 26 |
| Deadweight capacity, tons | 9100 |
| Stipulated normal average speed at sea, knots | 11 |
| Stipulated normal consumption of fuel oil per day, tons | 9 |

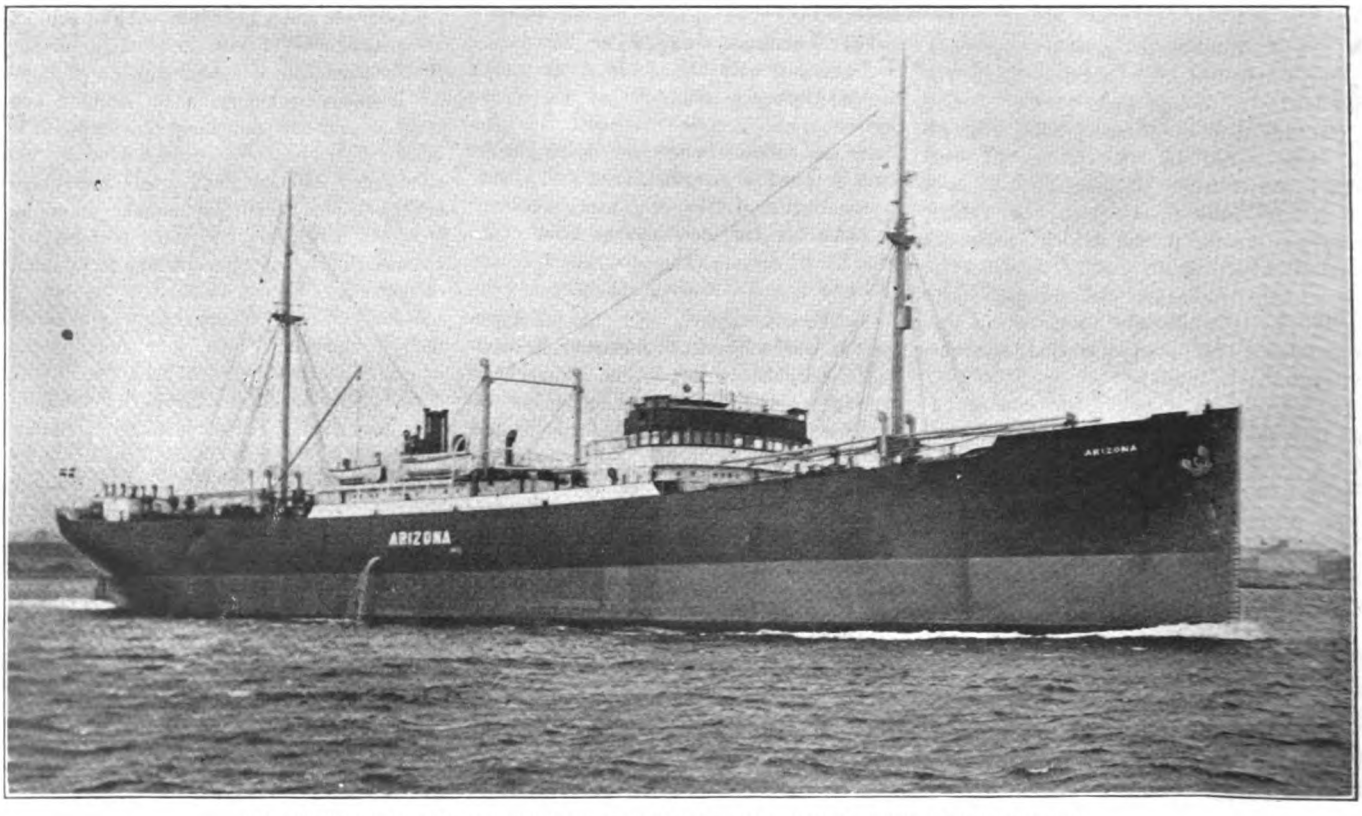
MACHINERY

| | |
|---|---|
| Type of machinery | 6 cyl. 4 cycle |
| Number of main engines | 2 |
| Cylinder diameter, m.m., | 590 |
| Stroke, m.m., | 900 |
| Revolutions per minute | 140 |
| Indicated horsepower | 2800 |
| Brake horsepower | 2200 |

The trial results over a measured mile were:

| | |
|---|---|
| Indicated horsepower average | 3132 |
| Rev. per min., average | 144.5 |
| Speed average | 11.215 |

During the consumption test, the main engines developed 2873.6 indicated horsepower at 141.4 revolutions per minute,




MOTORSHIP ARIZONA BUILT IN DENMARK FOR SOUTH AMERICAN SERVICE

at a fuel oil consumption of 141.21 grammes or 0.311 pound per indicated horsepower hour, net calorific value being 10,000 kg. cal. (18,000 B.t.u.) including the consumption of auxiliary engines producing the necessary current for the auxiliary machinery, steering engine and electric light.

The machinery is placed midship and is of Burmeister & Wain's standard type for twin-screw ships. The main engines are short stroke, forced lubricated crosshead engines, on the front end fitted with 3-stage air compressors supplying the necessary injection air for atomizing the fuel oil.

All auxiliary machinery in the engine room as well as the deck machinery is electrically driven, the necessary current being supplied by three 50-kilowatt diesel dynamos. The voltage of the current is 220 volts and for the lighting purpose it is transformed down to 110 volts by means of a motor generator.

Each of the generators is sufficient for supplying the necessary current under normal working conditions at sea. Two or all three generators have to be started, when the consumption of current is large, as for instance, when maneuvering with the maneuvering compressor running or when loading or unloading with the winches using a great deal of current.

The heating is effected by means of steam produced in a small cross tube boiler, this boiler also being able to deliver steam for fire extinguishing in holds.

The ARIZONA is the fourth motorship in the fleet of the United Shipping Co., Copenhagen, the other three motorships also being furnished with diesel engines from Burmeister & Wain. After the successful trial trip, the officials and the trial trip crew were landed in a tugboat, while the ship continued on her maiden voyage to South America.

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Capt. Francis Tuttle, for 32 years an officer of the United States coast guard service, died recently at the marine hospital, Port Townsend, Wash. He first served in the navy as a junior officer during the civil war, being with Admiral Farragut at Mobile bay. For many years he commanded coast guard vessels on expeditions into Bering sea and the Arctic. In 1897 he headed a relief party to Nome and thence into the Arctic to take aid to a party of whalers frozen in the Far North.

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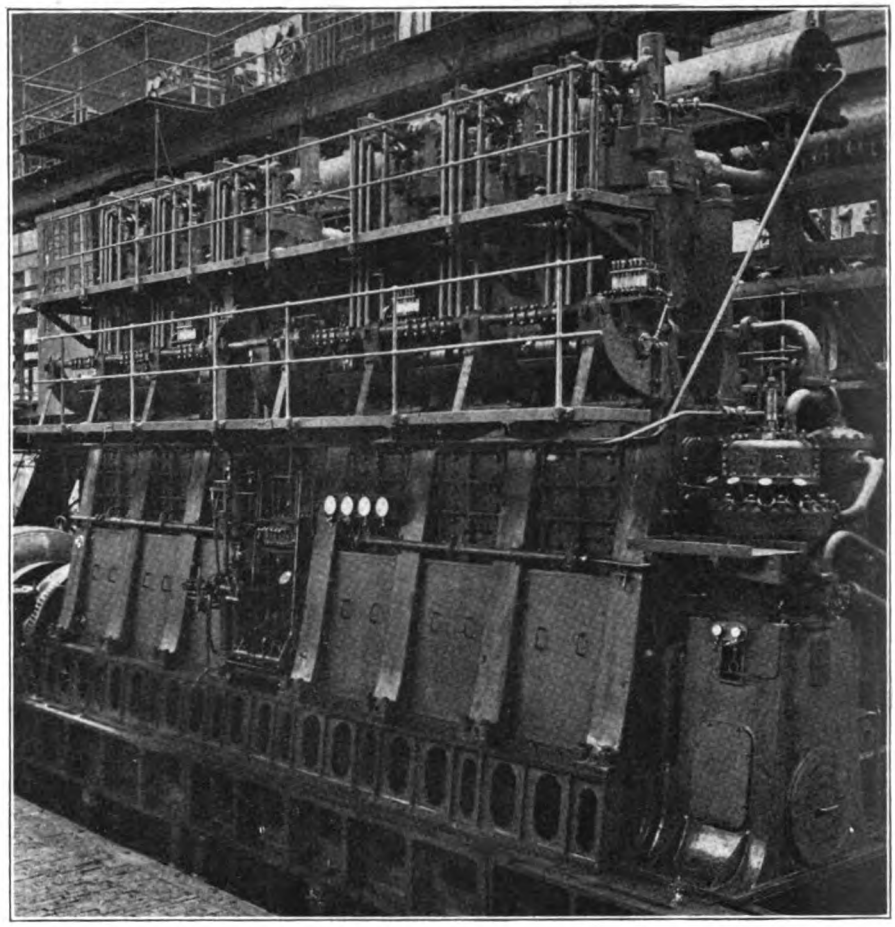
Eric Johnson, president of the Seattle Machine Works Seattle, has brought out an invention of an improved fuel feed for diesel engines. He claims to have so simplified the diesel principle as to cut the cost of construction one third.



6-CYLINDER, 4-CYCLE DIESEL ENGINE FOR DANISH BUILT MOTORSHIP ARIZONA

## Fewer Ships Are Idle

During the last six months of 1922 the idle steam tonnage of the world declined approximately three-quarters of a million gross tons and on Jan. 1, 1923, stood at around 9,000,000 tons, as shown by figures compiled by the transportation division of the department of commerce. During the whole of 1922, idle tonnage declined nearly 2,000,000 tons. Idle tonnage in British ports, which was 1,961,000 gross tons on Jan. 1, 1922, and 1,667,000 tons on July 1, 1922, dropped to 1,010,000 tons on Jan. 1, 1923. The tied-up tonnage in French ports, which increased from 1,085,000 tons to 1,200,000 tons during the first half of the year, declined to 730,000 tons at the end of 1922. Italian and Norwegian idle tonnage also declined. German idle tonnage is reported as quite small.

On the other hand, the idle fleet of the shipping board increased over 400,000 tons and nearly 200,000 more tons of privately owned American vessels were out of employment on Jan. 1, 1923, than on July 1. Japanese and Greek tonnage also had less employment at the end of the year than on July 1. The following table shows the idle tonnage in the principal maritime countries of the world. The figures in each case are not absolutely accurate and some interpolations have had to be made, but as a whole it gives a fair picture:

**Idle Gross Tonnage in the Principal Maritime Countries of the World**

| Country | Jan. 1, 1922 | July 1, 1922 | Jan. 1, 1923 |
|---|---|---|---|
| United States: | | | |
| Shipping board. | 4,314,000 | 3,978,000 | 4,411,000 |
| Shipping board tankers | 214,000* | 214,000* | 214,000 |
| Privately owned | 781,000 | 523,000 | 703,000 |
| United Kingdom.. | 1,961,000 | 1,667,000 | 1,010,000 |
| France | 1,085,000 | 1,200,000 | 730,000 |
| Italy | 585,000* | 585,000 | 472,000 |
| Holland | 327,000 | 330,000 | 330,000 |
| Norway | 207,000 | 112,000 | 53,000 |
| Sweden | 204,000 | 114,000 | 22,400 |
| Greece | 170,000 | 100,000 | 116,000 |
| Japan | 120,000 | 79,000 | 99,000 |
| Belgium | 275,000* | 275,000* | 275,000 |
| Denmark | 161,000 | 33,000 | ..... |
| Spain | 530,000* | 530,000 | 520,000 |
| **Total** | 10,934,000 | 9,740,000 | 8,955,400 |

*From best available data.

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The towboat SPRAGUE, largest in the world, recently transported 80,000 barrels of gasoline from Baton Rouge, La., to Memphis, Tenn., in a single voyage. The cargo was carried on six huge barges. It was the equivalent of six trainloads of freight. The trip upstream and return with empty barges was made by the SPRAGUE in 12 days.

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Increasing business has resulted in the decision to build additional terminal facilities at Bellingham, Wash. Construction of a freight pier and bunkers will proceed at once as the initial unit.

# Build Big Mississippi Carferry

## Pittsburgh Yard Launches Transfer Steamboat of Largest Size for Railroad Service — Description of Vessel

TAKING rank as the largest steamboat built and launched for inland waters, the railroad car and locomotive transfer GEORGE H. WALKER, slid down the ways into the Ohio river at the Neville island yard near Pittsburgh of the Dravo Contracting Co. on April 20. Built at a cost of approximately $250,000, this steamer which has a molded length of 340 feet, a beam over the guards of 91½ feet, a molded beam of 56 feet, and a molded depth of 11 feet, is destined for service on the lower Mississippi river between Anchorage and Baton Rouge, La.

Among the guests at the launching were: Col. E. N. Johnson, chief of United States engineers at Cincinnati; Maj. J. Franklin Bell, chief of United States engineers of the Pittsburgh district, and John W. Arras, assistant engineer, together with various Pittsburgh city officials and representatives of various steel, engineering, marine, and river interests. After the launching, the guests enjoyed a luncheon served in the recreation pavilion of the Dravo company.

While built for the Gulf Coast lines, the New Orleans, Texas & Mexico railroad, with general offices at Houston, Tex., the steamer probably will be utilized by the Illinois Central and other railroads as well. This side-wheel boat is of all-steel construction and has been designed for handling complete train service across the lower Mississippi river. Complete trains consisting of an engine and eleven 85-foot steel Pullman cars, or 25 loaded freight cars will be carried at a single crossing. It carries three tracks with switches arranged so that the cars can be shifted from one track to the other two. The parallel midship body is about 244 feet long; the entrance is 48 feet long and is of the modified scow-bow type so as to improve the navigating characteristics and to sweep aside driftwood. The boat has a sloping stern 48 feet in length. The design and construction of the complete ship, including the boilers and engines, was handled by the engineering staff and the shops and boat yards of the Dravo Contracting Co.

The hull is divided into 26 watertight and two oiltight compartments by means of transverse bulkheads and a centerline bulkhead. In addition to the longitudinal bulkhead on the centerline, one nonwatertight longitudinal wing bulkhead is on each side in way of the side tracks. These wing bulkheads are intercostal between the transverse bulkheads. The three fore and aft bulkheads and the sides of the boat, forming five longitudinal girders, provide ample strength and rigidity under all conditions of loading. The scantlings are such as to withstand the weights superimposed and to absorb shocks and impacts resulting from the heavy locomotives passing from the land cradles on to the floating structure.

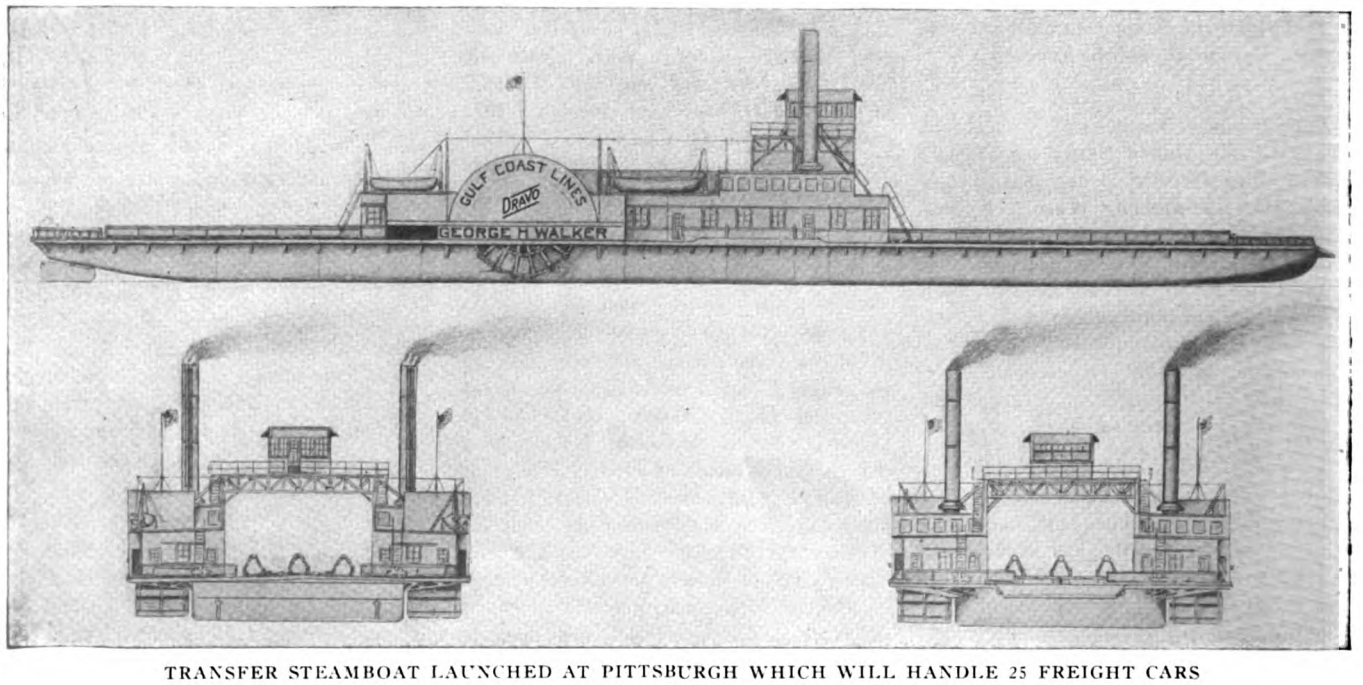
The shell plating is 7/16 inch throughout; deck plating ⅜ inch and 7/16 inch and all bulkheads are made up of ⅜-inch plating. The transverse bulkheads are closely spaced and with one longitudinal bulkhead in way of each track, the weights of the cars and the stresses resulting therefrom are well distributed over the entire structure. The racking and torsional strains are taken care of by trusses placed athwartship between the transverse bulkheads.

The guards are supported at every fourth frame by substantial outriggers of the truss construction type, and a deep web plate is fitted at every transverse bulkhead. In way of the machinery space, the outriggers are placed on alternate frames. Additional support is provided in the way of the paddle-wheels and boilers by means of stiffeners and hog rods from one side of the boat to the other.

The deck house is a comparatively light structure consisting of ¼-inch plating at the bottom with 3/16-inch plating at the top and 3/16-inch floor. Stiffeners are placed on alternate frames, with deck beams at every frame.

The three tracks are spanned from starboard to port side deck house by a bridge 27 feet long, supported by two heavy trusses and by double channel columns rising from the hull. The pilot house is built of wood and is 16 by 18 feet.

The boiler power plant is made up of two batteries of boilers, one on a side, each consisting of two boilers 6 feet in diameter and 18 feet long. The boilers are of the modified Bonson type and




TRANSFER STEAMBOAT LAUNCHED AT PITTSBURGH WHICH WILL HANDLE 25 FREIGHT CARS

will be adapted to the burning of fuel oil but will also permit the use of coal. Oil burners are of the Lientz type, using steam for atomization.

These boilers are designed for 200 pounds pressure and have a total heating surface of 7520 square feet. One battery of boilers is of sufficient capacity to furnish steam for both engines, so that the boilers on the other side of the boat can be shut down for repair or cleaning without suspending the operation of the boat. The flues are 3½ inches in size and water pipes connecting the headers are 4 inches, outside diameter.

Induced draft is provided for by steam exhausting into the smoke stacks, but in general the boilers will be operated under natural draft and the steam exhaust will be used for heating the feed water. The steam lines and the feed water lines are interconnected so that the main engine and auxiliaries on one side can draw steam from the boilers on the opposite side and the boilers can be served by the auxiliaries on either side.

The steamer is propelled by independently operated side wheels, 31 feet in diameter and 14 feet in length, having 18 buckets 36 inches wide. The wheels will be driven by two engines of the 2-cylinder simple noncondensing type. The wheels are carried by three cast steel flanges mounted on the shaft, which tapers to 11 inches in diameter at the outboard end.

The cylinders of the engines are 18 inches in diamater with 36-inch stroke and are inclined at an angle of 15 degrees from the horizontal, forming an open inverted "V." Each engine develops about 600 indicated horsepower at 90 revolutions per minute when supplied with steam of 200 pounds pressure.

The iron cylinder and valve chest are cast integral, forming a rugged and simple engine. Valves are of cast iron of the piston type. The piston rods and connecting rods are of forged steel machined all over. All the valve rods and piston rods have metallic packing. The connecting rods, which are of the closed-end type, are fitted with semisteel boxes and babbit lining.

The valve gear is of the Joy type, especially designed for the service, by means of which design a wide range of cut-off is obtained whereby the power can be nicely regulated to suit the requirements. The speed of the engine is geared down from 90 revolutions per minute to 15 revolutions per minute at the wheel by means of a single set of spur gears. The cylinders and valve chests and all steam pipe are carefully lagged to insure dry steam in the operation of the engines.

All bearings are babbit lined and well lubricated to effect a reduction of frictional loss to a minimum. All parts entering into the construction of the engines have been designed with a view to economy in operation and easy access for maintenance and overhauling.

The auxiliary equipment of the boat is complete in every respect. One 9 x 5 x 10-inch horizontal duplex Worthington feed pump is installed on each side of the boat. One 9 x 5¼ x 10-inch horizontal duplex Worthington sea suction pump is on the port side and one on the starboard side for transfering feed water from the river to the feed water heaters, which heaters are of the Cochrane open type. These pumps can also be used for fire pumps. There is also installed a 4½ x 2¾ x 4-inch sanitary pump of the horizontal duplex type and four 4½ x 2¾ x 4-inch horizontal duplex pumps are installed for fuel oil service. On each side of the boat is a feed water storage tank 5 feet in diameter and 12 feet long. The feed water heaters are mounted on top of the storage tanks.

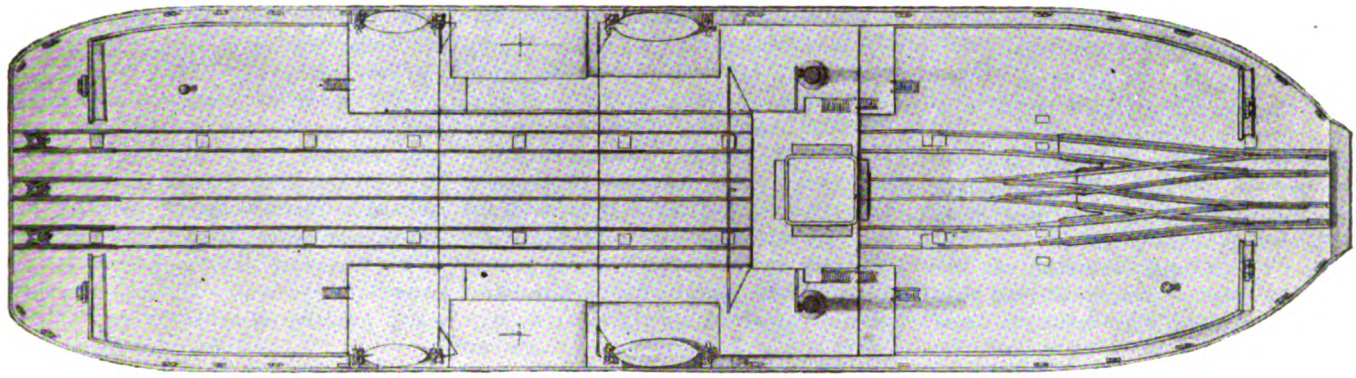
The steering engine is a 2-cylinder simple engine, 6 inches in diameter and 7-inch stroke and is located aft between the two tillers. A screw direct-connected to the crankshaft actuates two crossheads, one on each side, which move in an athwartship direction, and are connected to the tillers by means of links of "H" beam section. The follow-up gear is connected to the control valve whereby the angle of the rudder, as indicated by the tell-tale, can easily be controlled by the helmsman. The steering engine is operated from the pilot house by means of shafts and gears.

Two balanced rudders of the composite type are entirely covered with steel plates and filled with oak, the rudder stock being 11¾ inches outside diameter. Installed on the boat is a 10-kilowatt DeLaval steam turbine generator, which provides current for the lighting of the boat and for the searchlights.

A modern mechanical telegraph system has been installed in the pilot house and the engine rooms, eliminating the obsolete system of gong and jingles. Speaking tubes are fitted between the pilot house and engine rooms, and one tube extends from the pilot house to the aft end of the deck house.

Washrooms have been provided for the crew in the deck houses and are fitted with lockers. Ample storage space is provided for lines and spare parts and the boat is equipped with a forge shop and a carpenter shop in the aft part of the deck house, where a paint room is also provided. Office quarters are provided for supervision of the operations of the boat.

Every provision has been made to safeguard the passengers through watertight compartment subdivisions of the hull and through ample lifeboat facilities. The fire equipment apparatus and life saving equipment are up-to-date in every respect and meet the requirements of the United States steamboat inspection service. Mechanical davits of the Steward type are fitted for all lifeboats. The interests of the passengers on the cars have not been overlooked as the boat affords a 750-foot promenade during the period of crossing and an artistic hand rail is provided along the deck promenade.



DECK PLAN OF NEW MISSISSIPPI RIVER CAR FERRY

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CAPT. R. C. BRENNAN, recently superintendent of the Pacific Steamship Co., has been appointed operating manager. His headquarters remain at Seattle.

## Navy Will Ask Congress for More Ships

The navy department, it is expected, will definitely call to the attention of the next congress the serious deficiencies existing in the United States navy under the 5-4-3 ratio adopted by the disarmament conference. A survey of the international naval situation shows that the American seapower is between 300,000 and 400,00 tons short of its proper ratio. A program expected from Secretary Denby for making good this deficiency in ships and personnel, is expected.

Official opinion is practically unanimous that the greatest need of the navy is for modern scout craft, and it is predicted that immediate authorization will be urged for fast cruiser and submarines, with additional tonnage of these types to be added annually for a period of years. It has been suggested that the immediate program comprise at least eight modern cruisers to supplement the 10 of the DETROIT class now under construction, three scout and three fleet submarines of 2500 tons, three mine laying submarines, at least two airplane carriers of the LANGLEY type, in addition to those already under way. If this program goes through, it should serve as a practical aid to the shipbuilding industry.

## Will Repair Big Tanker

The Todd Shipyards Corp., Robins plant, Brooklyn, N. Y., has been awarded the contract at $167,000 for extensive repairs to the Texas Oil Co.'s tanker PENNSYLVANIA. Other bids for this work were: Newport News, $175,000; Morse, $176,000; Alabama, 179,488; Jahncke, $263,000. The tanker PENNSYLVANIA recently went ashore on the Nicaraguan coast and sustained severe bottom damage. She was drydocked at Mobile, Ala., for survey and left under her own power for the Robins plant in Brooklyn, accompanied by the Todd tug HARRY G. LYTLE.

## More Ship Contracts for Eastern Yards

More shipyard work than usual appears to be under negotiation at this time. It is understood that the California Fruit Co. is negotiating for five vessels. The New York Central railroad expected to open bids on a ferry boat May 15. Some talk is under way that the Westchester Ferry Co. is in the market for ferry boats, though nothing definite has been done. The New York Shipbuilding Corp., Camden, N. J., has received a contract for building two tug boats. The Pennsylvania railroad is in the market for bids on two, five or ten car floats. The William Cramp & Son Ship & Engine Building Co., Philadelphia, is reported to have received a contract for 10 pontoons, involving altogether about 150 tons of steel. The City of New York is interested in securing 12 steel garbage scows, involving about 1500 tons of steel.

# Permits Easy Change to Diesel Drive

DESIGNED especially for the Alaskan routes, a combined freight and passenger steamer is being built for the Alaska Steamship Co. by the Todd Dry Dock & Construction Corp. at its Tacoma yards. She was launched April 19 and delivery of the new steamer is set for June 1, 1923.

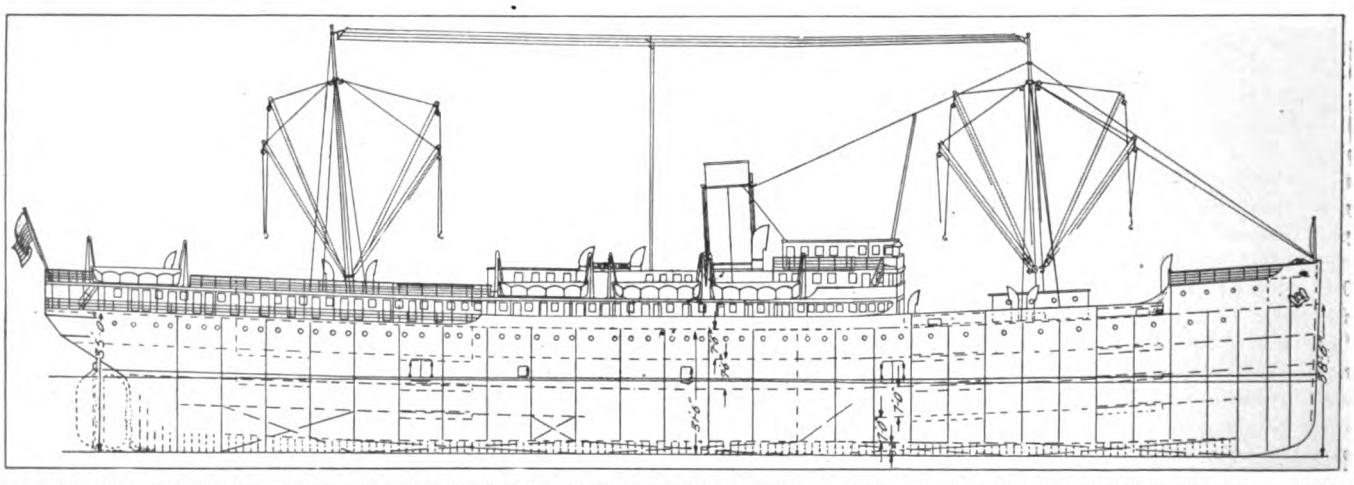
The vessel is to be capable of 16 knots although 15 knots is the speed called for in the specifications. There will be accommodations for 225 first cabin passengers, and 80 steerage passengers. The deadweight cargo capacity will be 3000 tons. The new steamer will represent an investment of $1,000,000.

One of the interesting features is the provision made for changing from steam to diesel power should it be deemed advisable at a future date. Plans for the new craft provide for so placing the center line shafting that motors can be installed at any time. It will be possible to remove one of the boilers and install diesel driven generators without difficulty. To this end everything is being planned and the change, if determined advisable, can be made with the least possible disturbance and cost.

### Hull Made Stronger

As copper ore is an important southbound cargo, the new craft will have a hull of exceptional strength. Along the top side and the sheer strake the vessel will be heavily reinforced.

Dimensions of the steamer will be: Length over all 364 feet; length between perpendiculars, 350 feet; beam molded, 49 feet; depth to freeboard or upper deck, 25 feet, 6 inches; draft loaded, 20 feet; deadweight to 20 feet draft, 3000 tons; fuel oil capacity, 1000 tons; and bale capacity, 155,000 cubic feet. She will be equipped with two twin screws and two 3-cylinder vertical triple expansion engines of 2800 indicated horsepower at 88 revolutions per minute, manufactured by the Hooven, Owens, Rentschler Co. There will be six straight water tube Babcock & Wilcox boilers. Steam pressure will be 200 pounds per square inch. They will be fitted with an induced draft system for burning fuel oil and are to be equipped with soot blowers.



ALASKA STEAMSHIP CO. TWIN-SCREW PASSENGER AND FREIGHT STEAMER JUST LAUNCHED AT TACOMA BY TODD DRY-DOCK & CONSTRUCTION CO.

# Practical Ideas for the Engineer

## Design New Antirolling Tanks for Large Liners—Discuss Pacific Fuel Problem—Repairing Large Rudder

ROLLING of ships at sea, particularly in the case of passenger ships, is a source of great discomfort to those on board. The period and character of the roll is influenced by the metacentric height. For a large metacentric heights, quick, jerky and extremely uncomfortable rolling will be set up, whereas with a small metacentric height, a longer period and easier roll is obtained. The amount of metacentric height may not, however, be reduced beyond the point of safety as it is a measure of the initial stability of the ship. Passenger ships are or should be designed with the least metacentric height commensurate with safety.

Great efforts to overcome or reduce rolling have been put forth for years. As a result, at least two practical methods have been developed, which after numerous applications have been found to work with a sufficient degree of success to warrant their continued use. The two outstanding methods are the application of the principles of the gyroscope developed by the Sperry Gyroscope Co., Brooklyn, N. Y., and the antirolling tanks developed by Dr. Frahm, a German engineer.

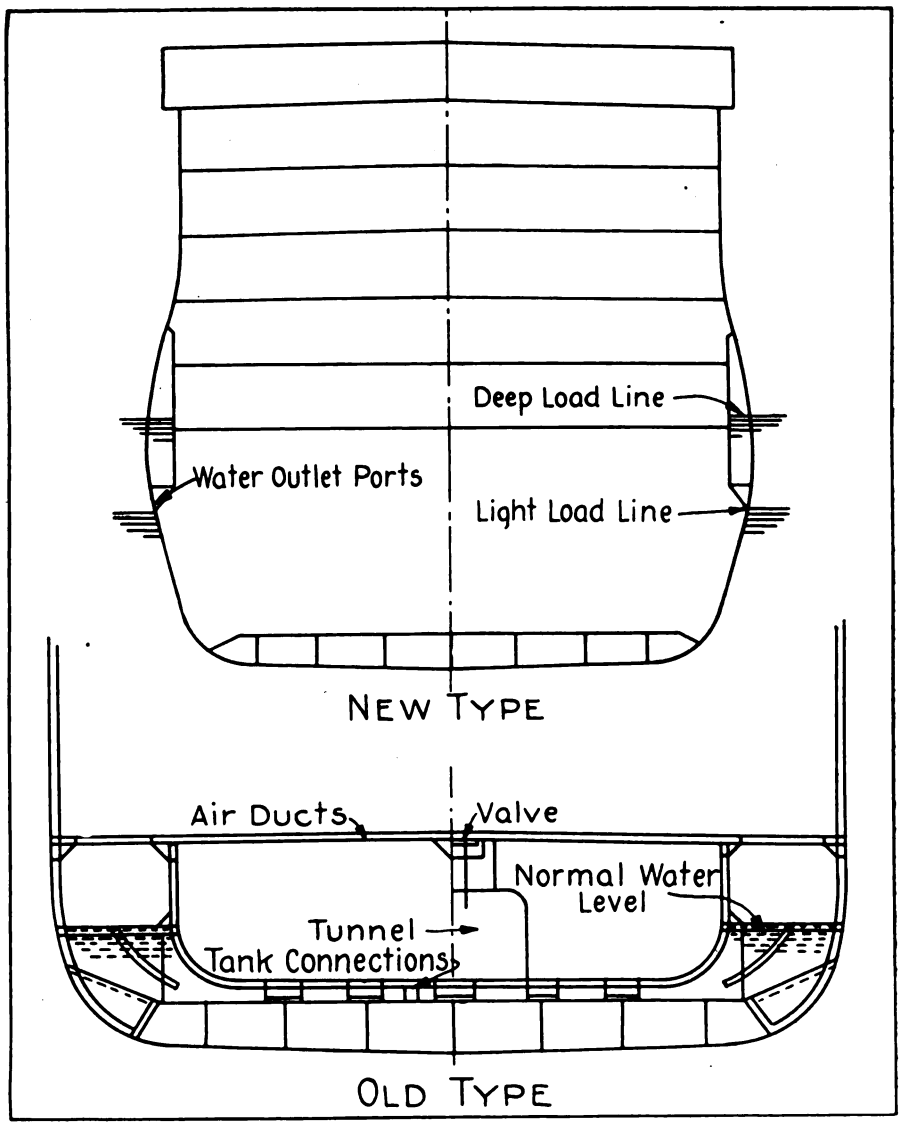
The complete mathematical analysis of the rolling of a ship is somewhat complicated. In general, however, rolling on account of the wind disturbed surface of the water forming hollows and crests known as waves is due to the shifting of the center of buoyancy, or what is the same the center of gravity, of the carene or under water body. In order to be in equilibrium, the center of buoyancy must be in line with the center of gravity of the ship itself. Consequently a moment of couple is set up tending to bring these centers into line. This is rolling.

If in any mechanical manner, a couple or moment is set up in opposition and equal to the moment tending to incline the ship, she will remain upright. For instance, if it were practicable to move quickly into place a sufficiently heavy weight or weights from the center line of the ship to either starboard or port anticipating the action of the waves tending to incline, rolling would be prevented and the ship would remain upright. This is what a stabilizer or an antirolling system tends to accomplish.

In practice, the attempt is made rather to minimize the rolling to a sufficient degree to give comfort than to stop it altogether, keeping the ship rigid by applied forces. Under severe conditions, such forces would be great and might set up undue stresses in the structure of the ship.

The gyroscopic stabilizer and the antirolling tanks are really practical methods of accomplishing the above. Briefly, the gyroscopic stabilizer sets up the necessary opposing moment or couple due to the well known principle that a disc rapidly revolved will set up a powerful force proportional to the number of revolutions and its mass, against any change from its plane and thus prevent rolling of the ship. The apparatus itself has been highly developed and its practical application is worked out to meet the conditions existing in each particular ship limiting its action to suit the individual needs. Ships of war as well as passenger ships have been fitted with the stabilizer to prevent rolling.

Antirolling tanks are based on the principle of the law of resonance. In accordance with this law, comparatively small impulses if synchronous with the period of the ship will augment the roll to serious proportions. Thus resonance between the wave and vessel is felt. By using a second-




TYPES OF ANTIROLLING TANKS, NEW SYSTEM HAVING BEEN INSTALLED ON TRANSATLANTIC LINER ALBERT BALLIN

ary and artificial resonance, the influence of the primary resonance between waves and ship may be overcome. For this purpose, water enclosed in a properly proportioned tank so that the period of oscillation will be the same as for the ship, performs steady and uniform movement which can be controlled by blocking air connections.

A definite difference of phase exists between the oscillation of a body and the impulse, so that the ship arrives at her maximum heel one-fourth of a period later than the wave arrives at its maximum slope toward the ship. The same law of course applies to the oscillations set up in the tank water by the rolling of the ship and the tank water will reach its highest or lowest level in the vertical part one-fourth of a period later than the maximum heel of the ship to one or the other side. Thus the total difference between the impulse of the waves and the oscillations of the tank water is 90 degrees plus 90 degrees or is equal to 180 degrees, and the latter will consequently act in exactly the opposite direction to the impulse of the waves. As the result the effect will be to dampen the rolling motion of the ship, limiting its extent to a degree sufficient to produce the necessary oscillations of the tank water to create a turning moment to balance the heeling moment imparted to the ship by the waves.

A radical change in the location of antirolling tanks has been made in recent ships. The old type, referring to the accompanying illustration, occupied considerable space within the ship itself.

This problem was found to be a serious matter in the design of a shallow draft steamer for the river ports in South America. The stability diminished to a dangerous degree when calculated with the antirolling tanks located in the usual position. Dr. Frahm solved the difficulty by making room for the tanks at the sides in way of the load water line by bulging out the shell, as shown in the illustration. It is evident that this method is considered an improvement over the old as it is adopted in the recently launched transatlantic liner Albert Ballin, where considerations of stability apparently did not enter into the choice.

# Marine Fuel Problem of Pacific Coast

BY D. DORWARD, JR.

IN THE operation of the American merchant marine, there is no one problem more vitally important than the question of fuel, it being the dominant factor attending steamship operation and the largest single item of cost entering into the operating schedule of a vessel.

The greater part of the fleet of vessels now operating from Pacific coast ports of the United States use oil as fuel. With the exception of Australian and Japanese bunkering ports, coal supplies for replenishing bunkering stations are brought from very distant points of origin and, therefore the cost of bunker coal at foreign stations, and even at Pacific coast ports, is very high—so much so that even at the present prices ruling for fuel oil the oil-fired vessel is the more cheaply operated from a fuel standpoint.

Fuel oil as a source of power is today receiving the closest attention by maritime interests, for the world's merchant shipping is now rapidly being converted to fuel oil. The advantages derived from liquid fuel instead of coal are so important, particularly in facilitating bunkering and increasing the steaming radius and conservation of labor on shipboard, that it will undoubtedly tend to rapidly increase the use of oil as fuel, particularly in view of the highly competitive situation developing between the merchant marine of Great Britain and the United States.

In the use of fuel oil on board vessels, there are many economical features involved which would make the continuance of the use of oil as a fuel for maritime purposes of the greatest importance, and which are briefly summarized as follows:

More economical operation;

Reduced crew;

Greater cargo capacity of the vessel on account of its ability to carry oil in compartments not otherwise available for cargo, such as double bottoms, peak tanks, etc.;

Ability of vessel's propulsive equipment to render more continuous service, steady steaming and uniform speed, thereby tending for more efficient operation;

Lessened wear and tear on vessel's equipment, machinery, boilers, and reduced cost of upkeep;

Less frequent painting;

Preserving effect of oil on vessel's double bottom, it being rarely necessary to undertake the most expensive item of renewing tank tops in oil burning vesels.

Statistics show that at the beginning of 1920, the world's merchant shipping approximated 55,000,000 tons, of which tonnage approximately 9,000,000 tons was already on an oil-burning basis and of which proportion approximately 1,000,000 tons was fitted for diesel-engine drive. This amount of shipping fully employed would occasion a demand for fuel oil annually of approximately 90,000,000 barrels. In 1918-1919, 12 per cent of the total world's tonnage was fitted to use oil, while in 1920 it had increased to 18 per cent.

The change from coal to oil has been occasioned by two conditions: The conversion of coal-burning vessels to an oil-burning basis and the construction of motor or diesel-engine-driven vessels. The adoption of the internal-combustion or diesel type of propulsive equipment is just beginning to assume important proportions in the United States; but in Great Britain and on the continent of Europe this phase of the development has been and is making rapid strides.

The motor-equipped ship has unquestionably a strong advantage in point of economy over oil-fired steam-equipped vessels; but it is expected that the change from coal to oil as applying on the world's shipping will be greater through the intermediate stage of oil-fired steam vessels, which it is expected will create a requirement of at least 10,000,000 barrels of fuel oil for each million tons of shipping using oil as fuel. Practically all of the vesels in operation by the United States shipping board and under private American ownership are substantially on an oil-burning basis, there being 49.4 per cent of these ships exclusively oil burners, 23.3 per cent coal burners, and 27.3 per cent convertible to burn either coal or oil.

In 1920, the fuel-oil requirements of the United States shipping board were in excess of 30,000,000 barrels, and while this demand was somewhat curtailed during the industrial depres-

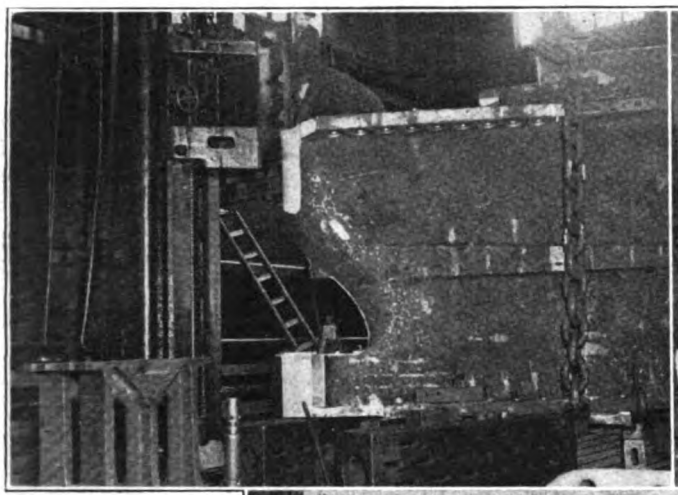
From a paper presented before the American Society of Mechanical Engineers.

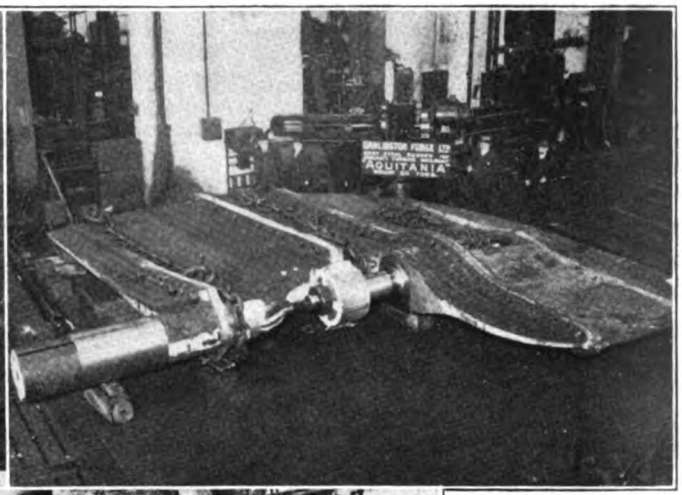
sion of 1920-1921, it is expected, however, that the resumption of international trade will not only revive but intensify the fuel requirements of the merchant-marine fleet.

The navies of the world are largely on an oil-burning basis, for the advantages of oil over coal for naval operations are of the utmost importance and undeniably make for greater efficiency. While the naval demand for fuel oil is small in comparison with that required by the merchant marine shipping, there are, however, about 5,000,000 barrels required annually for the American navy.

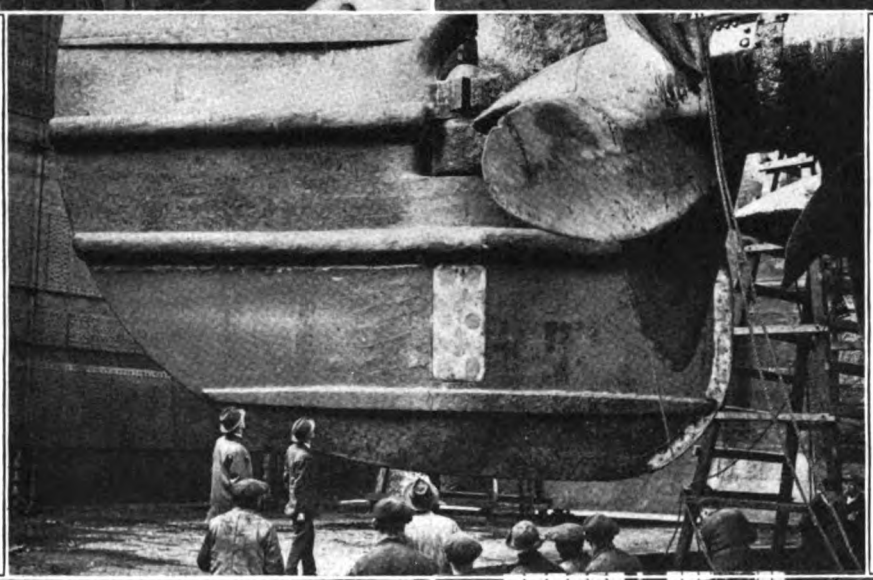
It is now more than evident that oil for merchant-marine transportation has assumed a standing of the utmost importance and it has been conceded by well known authorities that the strength of this demand is such that if necessary it can and will divert from industrial purposes the quantity required for shipping interests. At any rate, the significance of oil in maritime matters explains to a considerable extent the present world-wide interest that has been shown in oil. Particularly Great Britain has, by

## Rapid Repair of Huge Rudder of Transatlantic Liner Aquitania

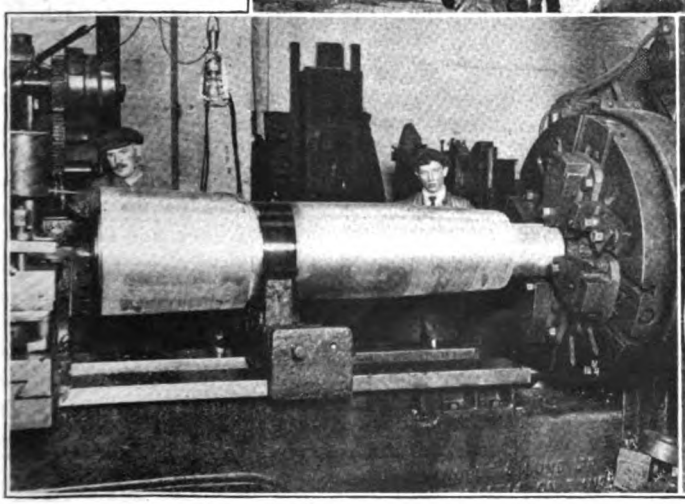


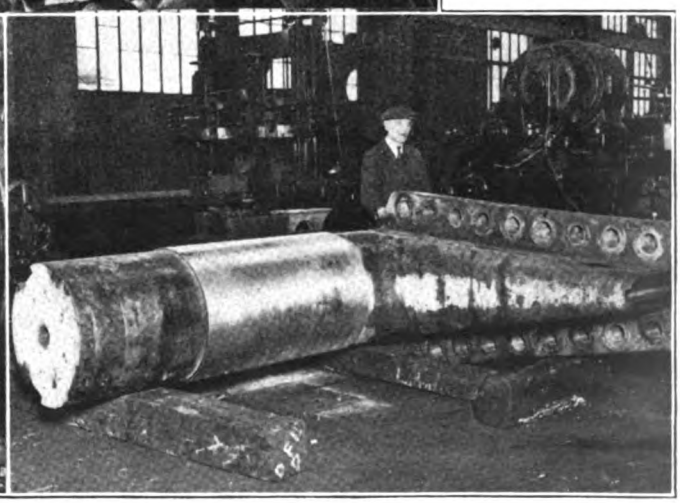



Docked for overhaul, the liner was found to have a cracked flange on her rudder. This is a hollow steel casting in three sections, the total strength being 28 feet, depth 23 feet and weight 80 tons. The rudder was dismantled and sent to foundry.



New parts were cast and fitted and the whole replaced in a short time. Views show steel blade on planer; testing alignment of rebuilt rudder; in place; steel pintle in lathe and original rudder stock ready for connecting to new steel blade





*Daily Mirror*

her policy in acquiring foreign reservations of petroleum, indicated beyond question the great advantage of fuel oil for naval operations and ocean transportation, and which factors have in addition been the source of much activity in the United States.

On large passenger vessels fitted for oil fuel it has been noted that an enormous saving in operating costs has been effected on account of lessened wear and tear on such items as carpets, draperies and cabin equipment.

The great problem confronting steamship operators today is the question as to whether the world's supply of petroleum is sufficient to sustain automotive transportation on land, industrial power plants, lubrication requirements of industry, and whether the supply will support the great change in the conversion of ocean shipping to an oil-burning basis.

Were the 55,000,000 tons of world's ocean shipping converted to an oil-burning basis, it would require an annual consumption of over 500,000,000 barrels of oil, which represents nearby the total quantity of petroleum produced in the world today. While this consumption could, of course, be somewhat reduced by a more universal adoption of diesel engines, it would, nevertheless, be of huge proportions.

Utilization of oil by ocean shipping, however, is today governed largely by the matter of price; and upon the production of the world's most extensive deposits being exhausted it is possible that some reduction may be forced in the amount of fuel oil used for maritime purposes. This possibility seems to have been lost sight of under the present competitive conditions existing and on account of the great advantages offered by the use of fuel oil at the present price level. Regardless of the future of fuel oil, the fact remains that it is now definitely involved in competitive shipping efforts and its use is fully expected to grow for a considerable period at least.

Powdered coal is still in an experimental stage and it is questionable if its use on board vessels could be attended with any degree of success. It is expected, however, that the development of automatic stokers for use on shipboard will aid materially in the continued use of coal for marine purposes.

The consumers of petroleum oil are now facing a condition of decreasing production and increasing demand, which condition points inevitably to the necessity of developing other sources of fuel for power.

Hydroelectric plants can aid materially in the conservation of fuel oil in the power they produce, but industrial plants, railroads, and similar institutions will eventually have to find other sources of power than that developed by fuel oil, in order to supply the increasing demand for marine purposes, although of the substitute fuels, coal will undoubtedly occupy the chief position.

Even at this stage it is significant that coal is now being brought from Australian ports in American vessels using oil as fuel; and large steamship companies having many vessels usually confine that portion of their fleet operating in Pacific coast waters to those vessels fitted for oil burning.

Approximately 60 per cent of the crude oil produced in California is refined, at least in part, before being utilized. The increased demand for gasoline and lubricants and the rapid strides in refinery efficiency are resulting in the refining of a constantly increasing proportion of the oil with a resultant smaller quantity available for fuel purposes. Practically 50 per cent covers oil exports to the Orient from California ports, though these exports are confined mostly to fuel oil to Hawaii, Central America and South America, gasoline and distillate to Australia, and kerosene to the Far East.

CAPT. JOHN BRADSHAW

Commander of the new 27,200-ton Red Star liner BELGENLAND, is an American citizen, resident of New York, who has a long and distinguished record in sea service. He was for 10 years in command of the Red Star liner LAPLAND before his recent promotion.

The demand for refined oil products is rapidly increasing and will be accelerated by the potential oil shortage in other fields of the United States and by the necessity of using California oils to offset this shortage. To meet this increasing demand, California oil must be used more efficiently and sparingly.

California now produces between one-quarter and one-fifth of the world's supply of petroleum oils and one-third of the United States' supply. Statistics show that to Jan. 1, 1921, the United States had produced 5.4 billion barrels; and subtracting this quantity from the original supply of 11.3 billion barrels as estimated by the United States geological survey in 1918, would leave as a working reserve only 5.9 billion barrels, with the annual requirements running over half a billion barrels.

Important strides have been made in refinery efficiency, also in number of refineries. The refining capacity of the entire country increased 18 per cent during 1919 and 23 per cent in 1920. This increase in refinery capacity together with greater efficiency will certainly have the effect of reducing the quantity of oil available for fuel.

It is a fact, however, that petroleum can not be expected radically to displace coal in industry and transportation, since a crude petroleum production of about 3,000,000,000 barrels per year would be necessary to drive coal from its present position.

For the future, fuel oil will represent a reducing percentage of the crude petroleum produced, for the more specialized uses, such as automotive power, lubricants and chemical by-products are coming into more importance and must be considered in preference to the demand for industrial fuel. However, fuel in liquid or gaseous forms is of such importance and has so many advantages in convenience and efficiency that it may reasonably be expected to continue to supplant solid fuels, which solid fuels must take second place as regard certain industrial uses and marine propulsion.

The output of crude petroleum in the United States is conceded to have virtually reached its maximum, and as the proved fields of Mexico are showing a rapid decline, a marked falling off in imports from that source may be expected. Cheap supplies of petroleum will soon be a thing of the past; and the answer to the domestic petroleum problem does not lie in importations from foreign sources.

Efficiency in production and utilization and supplemental sources of supply at home must share with foreign supplies the responsibility of sustaining those activities exclusively dependent upon liquid fuel, and of which none is more important than the question of fuel for marine purposes.

# Marine News in a Personal Way

## Intimate Gossip About What Leaders in the Maritime World Are Doing

EDWARD WILDING, managing director of Harland & Wolff, Ltd., Belfast, Ireland, made a short visit to the United States recently on the new Red Star liner BELGENLAND, returning by the same ship. Though still comparatively young, Mr. Wilding occupies an important place in the shipbuilding industry in Great Britain. It was largely under his direction and through his highly developed technical knowledge and experience that the successful rebuilding of the BELGIC into the new and magnificent BELGENLAND, was carried out at the Harland & Wolff yard. While in New York at a dinner on the BELGENLAND, Mr. Wilding in a speech, referred to the question then of general interest as to the relative sizes of the LEVIATHAN and MAJESTIC. Mr. Wilding stated that it was a part of his duty while serving with the reparations commission to handle the technical details and statistics on a number of the larger vessels that were transferred from the German to other flags. Among these vessels were the VATERLAND and the BISMARCK. In carrying out this work, he came into direct contact with Rudolph Blohm of Blohm & Voss, the builders of these two ships. Mr. Blohm who was intimately connected with the design of both the BISMARCK and the VATERLAND, is of the opinion that the BISMARCK is the larger of the two vessels. The present LEVIATHAN was the former VATERLAND and the MAJESTIC was formerly the BISMARCK. Mr. Wilding also pointed out that increased tonnage means constantly recurring additional charges in connection with the operation of the ship such as tonnage dues, port dues and drydocking charges and that owners always require the shipbuilder to keep the gross tonnage figure as low as possible.

*P. & A. Photos*

EDWARD WILDING

In this connection, however, this much may be said in reply to Mr. Wilding's statement: The increased gross tonnage of the LEVIATHAN was, of course, a matter beyond the control of the builders in the construction of the ship. The new gross tonnage was determined in the readmeasurement of the vessel by the official admeasurers of the United States. As it has always been the custom for passenger steamship lines to advertise their vessels on the basis of their gross tonnage, the figure being what it is, it is entirely proper and legitimate for the present owners of the LEVIATHAN to advertise her as the largest ship in the world. The value in a business sense in being able to make the statement truthfully will probably considerably more than make up for the additional charges that the ship will have to bear on this account.

* * *

E. V. RHODES, for a number of years associated with the Steele Steamship Line, Inc., first in Galveston, Tex., as marine superintendent, then as assistant general manager there, and for several years past manager in New Orleans, has resigned his position to organize a company to supply bunker coal to ships at New Orleans.

* * *

COL. RHINELANDER WALDO, former police commissioner of New York city and S. OAKLEY VANDERPOEL, senior partner of the firm of VanderPoel, Pausner & Jefferson, insurance, New York, have been elected directors of Megee Bros., Ltd., ship brokers and steamship agents, Drexel building, Philadelphia.

* * *

RICHARD M. SEMMES, recently resigned as northwest district manager of the shipping board, Seattle, has assumed his new duties as manager of the East Waterbury Dock & Warehouse Co., Seattle.

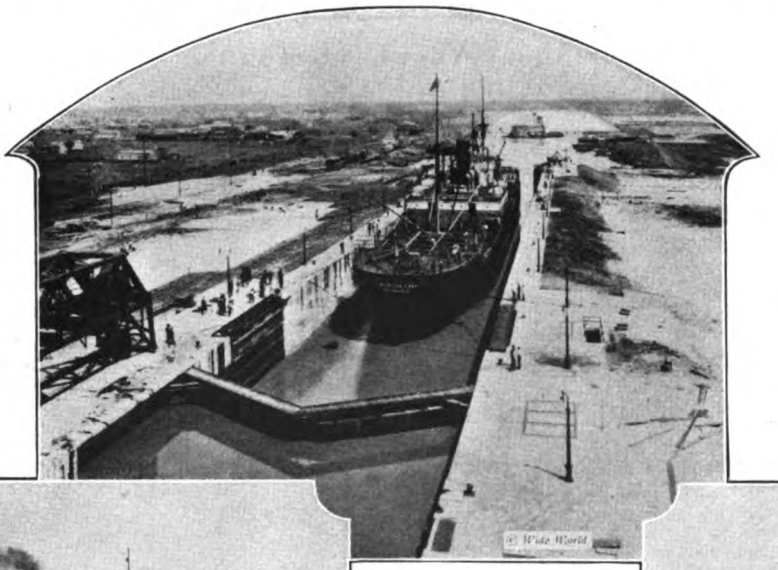
A. S. HEBBLE, who has for years filled the important office of superintendent engineer for the Southern Pacific Lines, returned to the United States in April on the steamship MAJESTIC from an extended tour of Europe. While abroad, he visited the largest manufacturers of diesel engines in England, Scotland, Denmark, Germany, France, Italy and Holland. Mr. Hebble stated that he was most favorably impressed with the progress that has been made in the development of diesel engines and he is of the opinion that the diesel engine is reliable and economical and offers great possibilities for the American shipowner to compete in world trade. His observation, he stated, showed that the diesel vessel has a marked advantage over the steam propelled vessel and more particularly so on long voyages. In regard to the adoption of this type of propulsion for passenger ships, Mr. Hebble declared that the diesel method was ideal for passenger liners up to 25,000 tons and of a speed of 18 knots. He said that the double acting diesel engine is receiving serious attention and indications are that satisfactory double acting engines of this type will come into use within a few years.

A. S. HEBBLE

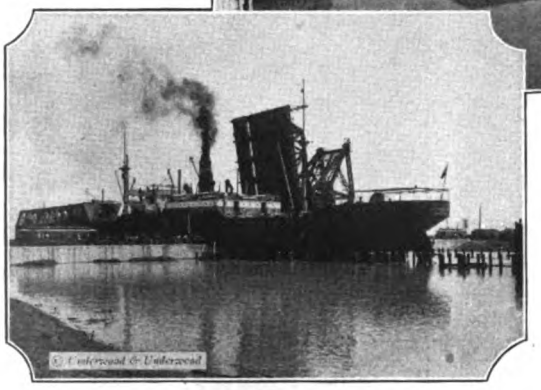
* * *

HARRY L. HUDSON has been re-elected manager of the port of Portland, Oreg.

# Photographs from Far and Near

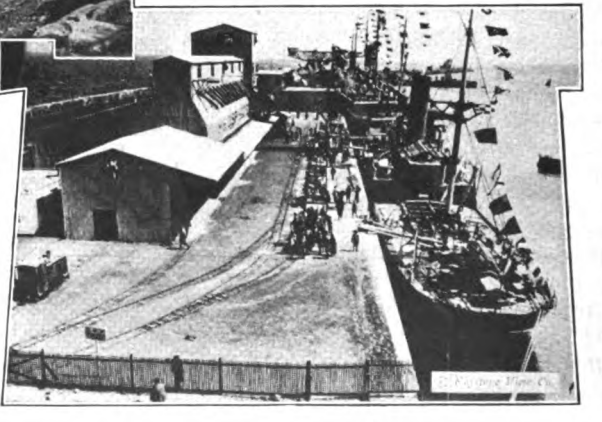


First ocean vessel, 7800-ton U. S. freighter Salvation Lass, locking through New Orleans' industrial canal which may lead to a new short-cut route to the gulf



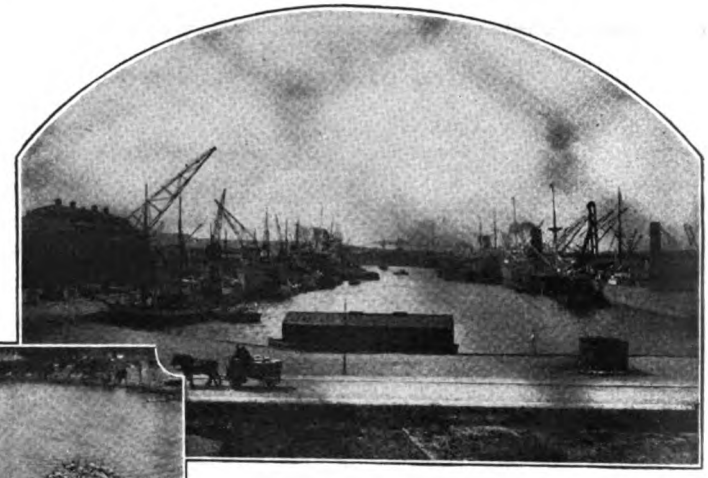
U. S. Modoc of the North Atlantic ice patrol close to a huge berg near scene of Titanic disaster

Another Mayflower but carrying the pilgrims this time to the upper reaches of the Nile River

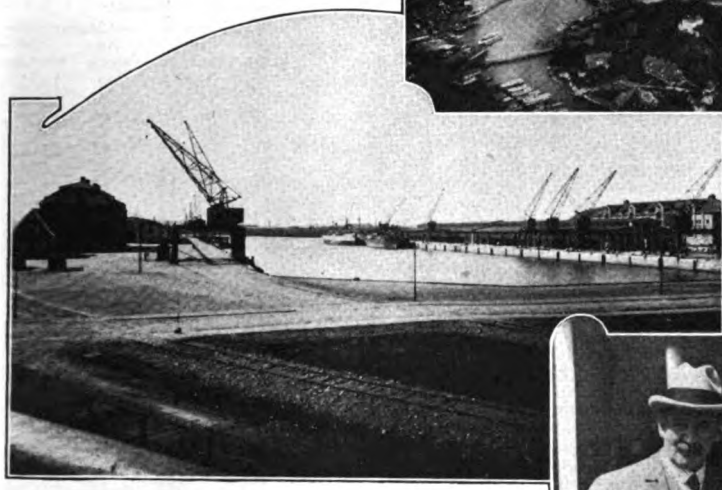


New landing stage just completed by the French at Casablanca, Morocco. Regular service is maintained with Marseilles and French Atlantic ports

# Latest Marine News in Pictures

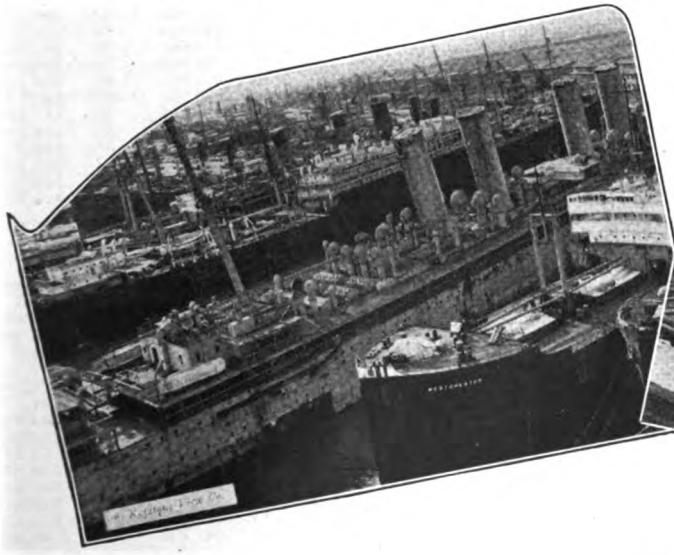


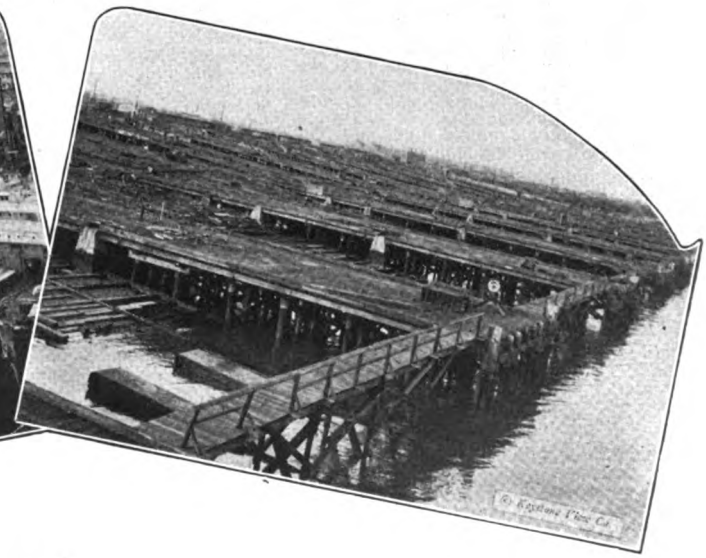
Sweden decided a few years ago to test the advantages of a free port. As a result, the port of Gothenburg was built and is now operating a modern free port terminal. Traffic through the port is gaining steadily



Joseph Conrad, one of the world's greatest authors, on his first trip to this country with another famous sea writer, Capt. W. Bone (right) and the latter's brother, Muirhead Bone, (left) noted etcher

Hog Island as it looks today with the piers jammed with idle vessels and the ways stripped and deserted. Four-funnel steamer in foreground is the ex-cruiser Von Steuben





# Marine Business Statistics Condensed

## Record of Traffic at Principal American Ports for Past Year

### New York

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 469 | 1,818,531 | 467 | 1,788,555 |
| March | 477 | 1,764,093 | 494 | 1,857,212 |
| February | 395 | 1,437,919 | 413 | 1,529,096 |
| January | 423 | 1,679,843 | 439 | 1,690,010 |
| December, 1922. | 397 | 1,569,778 | 473 | 1,819,341 |
| November | 426 | 1,626,068 | 463 | 1,805,798 |
| October | 452 | 1,846,327 | 467 | 1,848,637 |
| September | 519 | 1,985,981 | 542 | 2,104,884 |
| August | 515 | 1,772,837 | 508 | 1,865,798 |
| July | 509 | 1,928,541 | 520 | 1,977,690 |
| June | 486 | 1,718,879 | 551 | 2,070,048 |
| May | 524 | 1,769,601 | 496 | 1,759,780 |
| April | 454 | 1,651,584 | 473 | 1,758,160 |

### Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 87 | 218,177 | 83 | 229,333 |
| March | 111 | 306,580 | 76 | 209,261 |
| February | 67 | 160,678 | 54 | 139,701 |
| January | 98 | 287,240 | 64 | 182,402 |
| December, 1922. | 78 | 209,962 | 63 | 167,736 |
| November | 75 | 221,130 | 78 | 241,326 |
| October | 80 | 205,137 | 73 | 202,326 |
| September | 103 | 261,963 | 74 | 224,079 |
| August | 104 | 273,123 | 76 | 222,478 |
| July | 116 | 307,058 | 84 | 248,337 |
| June | 103 | 282,251 | 83 | 233,964 |
| May | 117 | 310,117 | 80 | 234,220 |
| April | 94 | 245,785 | 63 | 197,807 |

### Norfolk and Newport News

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 21 | 65,350 | 73 | 212,453 |
| March | 16 | 51,333 | 71 | 200,858 |
| February | 8 | 24,958 | 42 | 130,121 |
| January | 14 | 41,127 | 44 | 121,152 |
| December, 1922. | 19 | 52,716 | 40 | 137,081 |
| November | 6 | 21,036 | 38 | 118,738 |
| October | 17 | 44,423 | 46 | 149,670 |
| September | 5 | 22,051 | 45 | 132,751 |
| August | 15 | 43,887 | 51 | 158,879 |
| July | 22 | 62,986 | 55 | 158,254 |
| June | 22 | 73,791 | 56 | 175,961 |
| May | 21 | 61,513 | 73 | 198,599 |
| April | 18 | 59,180 | 83 | 232,485 |

### San Francisco

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 61 | 199,831 | 63 | 227,467 |
| March | 50 | 168,399 | 71 | 237,195 |
| February | 47 | 165,333 | 60 | 214,686 |
| January | 51 | 156,249 | 65 | 216,083 |
| December, 1922. | 54 | 187,648 | 68 | 234,385 |
| November | 42 | 154,024 | 42 | 154,280 |
| October | 59 | 159,855 | 69 | 261,687 |
| September | 52 | 163,697 | 65 | 233,079 |
| August | 65 | 221,288 | 68 | 219,326 |
| July | 64 | 194,586 | 55 | 191,574 |
| June | 51 | 182,219 | 47 | 161,761 |
| May | 50 | 170,506 | 56 | 191,858 |
| April | 50 | 174,713 | 54 | 190,928 |

### Baltimore

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 159 | 470,698 | 138 | 416,969 |
| March | 123 | 375,762 | 117 | 354,803 |
| February | 80 | 240,133 | 94 | 275,291 |
| January | 115 | 322,661 | 110 | 306,393 |
| December, 1922. | 110 | 322,948 | 104 | 380,616 |
| November | 114 | 361,162 | 132 | 403,593 |
| October | 97 | 289,239 | 101 | 304,431 |
| September | 107 | 333,387 | 112 | 298,444 |
| August | 110 | 326,163 | 106 | 300,080 |
| July | 103 | 320,104 | 90 | 280,394 |
| June | 99 | 280,002 | 118 | 333,877 |
| May | 117 | 350,494 | 103 | 282,285 |
| April | 98 | 277,582 | 110 | 319,103 |

### Seattle

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 32 | 141,569 | 31 | 133,950 |
| March | 28 | 129,070 | 30 | 138,428 |
| February | 26 | 120,548 | 39 | 156,258 |
| January | 27 | 125,551 | 36 | 155,129 |
| (Inclusive of Domestic) | | | | |
| December, 1922. | 201 | 560,159 | 198 | 564,367 |
| November | 138 | 374,871 | 139 | 374,871 |
| October | 164 | 417,901 | 148 | 406,498 |
| September | 159 | 375,340 | 159 | 382,079 |
| August | 162 | 396,363 | 153 | 387,908 |
| July | 140 | 373,211 | 137 | 371,526 |
| June | 139 | 384,290 | 137 | 354,702 |
| May | 138 | 357,583 | 150 | 361,835 |
| April | 129 | 328,172 | 154 | 365,057 |

### New Orleans

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 234 | 612,572 | 237 | 623,539 |
| March | 253 | 648,990 | 269 | 682,080 |
| February | 204 | 559,638 | 206 | 539,965 |
| January | 242 | 713,589 | 233 | 695,524 |
| December, 1922. | 211 | 543,884 | 222 | 573,111 |
| November | 220 | 598,306 | 219 | 599,150 |
| October | 239 | 630,306 | 235 | 625,605 |
| September | 212 | 555,017 | 223 | 571,299 |
| August | 249 | 625,819 | 250 | 629,150 |
| July | 227 | 570,709 | 236 | 601,740 |
| June | 253 | 596,752 | 234 | 587,488 |
| May | 236 | 632,495 | 230 | 610,916 |
| April | 221 | 565,559 | 225 | 594,842 |

### Boston

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 106 | 328,372 | 67 | 197,510 |
| March | 106 | 330,766 | 51 | 139,776 |
| February | 102 | 323,880 | 48 | 128,949 |
| January | 148 | 429,849 | 61 | 160,090 |
| December, 1922. | 138 | 383,366 | 61 | 181,975 |
| November | 130 | 357,264 | 59 | 123,255 |
| October | 149 | 408,855 | 91 | 217,899 |
| September | 193 | 511,027 | 101 | 248,328 |
| August | 192 | 449,871 | 116 | 203,774 |
| July | 159 | 324,795 | 94 | 229,492 |
| June | 137 | 169,015 | 94 | 161,888 |
| May | 133 | 251,304 | 104 | 192,231 |
| April | 71 | 138,683 | 103 | 270,499 |

### Mobile

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 85 | 199,871 | 82 | 163,074 |
| March | 88 | 203,032 | 88 | 206,285 |
| February | 83 | 186,479 | 72 | 160,777 |
| January | 77 | 145,151 | 67 | 153,001 |
| December, 1922. | 66 | 123,746 | 56 | 119,821 |
| November | 68 | 147,775 | 53 | 130,769 |
| October | 59 | 143,207 | 52 | 110,398 |
| September | 66 | 121,037 | 51 | 85,801 |
| August | 60 | 112,431 | 65 | 137,552 |
| July | 79 | 152,475 | 73 | 138,543 |
| June | 77 | 153,357 | 76 | 141,413 |
| May | 61 | 109,793 | 55 | 114,691 |
| April | 61 | 144,237 | 62 | 123,238 |

### Los Angeles

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| March, 1923 | 115 | 251,459 | 90 | 185,155 |
| February | 86 | 148,957 | 83 | 137,564 |
| January | 91 | 153,564 | 92 | 141,332 |
| December, 1922. | 133 | 132,114 | 76 | 83,537 |
| November | 110 | 111,803 | 111 | 112,934 |
| October | 117 | 115,548 | 138 | 94,522 |
| September | 61 | 127,969 | 96 | 133,561 |
| August | 52 | 143,931 | 43 | 117,758 |
| July | 44 | 125,139 | 48 | 138,275 |
| June | 48 | 109,261 | 38 | 90,915 |
| May | 47 | 141,219 | 55 | 174,644 |
| April | 53 | 161,709 | 45 | 138,927 |
| March | 75 | 172,471 | 59 | 139,424 |

### Key West

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 84 | 85,964 | 83 | 88,475 |
| March | 91 | 88,639 | 90 | 83,220 |
| February | 69 | 68,735 | 64 | 68,658 |
| January | 89 | 81,622 | 86 | 79,210 |
| December, 1922. | 74 | 77,623 | 78 | 85,839 |
| November | 69 | 71,740 | 70 | 71,705 |
| October | 61 | 67,755 | 64 | 77,225 |
| September | 57 | 64,645 | 59 | 62,676 |
| August | 65 | 69,962 | 61 | 65,883 |
| July | 67 | 80,673 | 67 | 85,336 |
| June | 60 | 73,308 | 58 | 73,842 |
| May | 89 | 107,629 | 82 | 101,318 |
| April | 77 | 81,917 | 81 | 86,471 |

### Portland, Me.

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 22 | 75,012 | 29 | 100,274 |
| March | 29 | 94,128 | 31 | 83,391 |
| February | 33 | 91,190 | 36 | 100,312 |
| January | 49 | 144,429 | 42 | 126,949 |
| December, 1922. | 48 | 144,019 | 48 | 136,247 |
| November | 22 | 45,567 | 21 | 46,755 |
| October | 27 | 60,114 | 22 | 49,594 |
| September | 32 | 68,125 | 27 | 57,609 |
| August | 28 | 42,746 | 28 | 47,459 |
| July | 19 | 39,950 | 20 | 39,571 |
| June | 11 | 16,601 | 15 | 21,765 |
| May | 16 | 21,380 | 10 | 22,477 |
| April | 14 | 51,228 | 18 | 62,091 |

### Savannah

(Exclusive of Domestic)

| Month | —Entrances— No. Ships | Net Tonnage | —Clearances— No. Ships | Net Tonnage |
|---|---|---|---|---|
| April, 1923 | 26 | 81,582 | 27 | 83,365 |
| March | 31 | 95,905 | 30 | 89,323 |
| February | 31 | 87,315 | 31 | 87,703 |
| January | 28 | 93,564 | 28 | 93,587 |
| December, 1922. | 22 | 66,619 | 17 | 57,279 |
| November | 14 | 41,665 | 15 | 40,606 |
| October | 19 | 52,065 | 19 | 46,054 |
| September | 26 | 68,878 | 26 | 73,540 |
| August | 22 | 63,662 | 22 | 59,974 |
| July | 23 | 66,833 | 23 | 61,655 |
| June | 11 | 24,870 | 20 | 53,367 |
| May | 11 | 20,536 | 16 | 40,181 |
| April | 8 | 20,485 | 15 | 42,591 |

### Galveston

(Exclusive of Domestic)

| Month | —Entrances— No. Ships | Net Tonnage | —Clearances— No. Ships | Net tonnage |
|---|---|---|---|---|
| April, 1923 | 65 | 162,317 | 77 | 209,388 |
| March | 58 | 170,841 | 97 | 287,278 |
| February | 48 | 146,944 | 76 | 233,591 |
| January | 69 | 219,967 | 89 | 282,889 |
| December, 1922. | 64 | 214,952 | 79 | 260,159 |
| November | 56 | 174,964 | 87 | 304,352 |
| October | 59 | 156,587 | 85 | 260,702 |
| September | 48 | 144,403 | 56 | 187,724 |
| August | 59 | 180,814 | 63 | 203,194 |
| July | 52 | 165,276 | 50 | 186,201 |
| June | 61 | 193,016 | 61 | 200,957 |
| May | 60 | 196,575 | 52 | 200,787 |
| April | 64 | 190,675 | 63 | 210,853 |

### Portland, Oreg.

(Exclusive of Domestic)

| Month | —Entrances— No. Ships | Net Tonnage | —Clearances— No. Ships | Net Tonnage |
|---|---|---|---|---|
| April, 1923 | 107 | 261,426 | 105 | 259,503 |
| March | 109 | 320,448 | 129 | 320,035 |
| February | 100 | 264,371 | 99 | 257,402 |
| January | 95 | 265,440 | 101 | 286,806 |
| December, 1922. | 98 | 266,774 | 107 | 291,126 |
| November | 98 | 266,706 | 105 | 283,881 |
| October | 109 | 290,048 | 109 | 267,006 |
| September | 111 | 313,168 | 108 | 298,452 |
| August | 102 | 256,671 | 103 | 259,170 |
| July | 95 | 254,553 | 88 | 233,744 |
| June | 104 | 300,517 | 110 | 319,637 |
| May | 85 | 226,853 | 88 | 230,176 |
| April | 89 | 245,702 | 90 | 244,402 |

# Marine Business Statistics Condensed

## Port Traffic Record

### Houston

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| March, 1923..... | 34 | 69,428 | 51 | 135,906 |
| February ..... | 49 | 50,379 | 48 | 167,872 |
| January ..... | 49 | 36,744 | 52 | 146,532 |
| December, 1922... | 58 | 70,948 | 53 | 195,322 |
| November ..... | 65 | 72,192 | 63 | 215,043 |
| October ..... | 55 | 57,106 | 53 | 168,254 |
| September ..... | 43 | 46,600 | 43 | 97,005 |
| August ..... | 35 | 40,503 | 32 | 63,281 |
| July ..... | 29 | 30,909 | 32 | 73,299 |
| June ..... | 38 | 48,938 | 36 | 74,798 |
| May ..... | 44 | 45,108 | 42 | 134,046 |
| April ..... | 42 | 61,751 | 47 | 98,825 |
| March ..... | 48 | 45,312 | 40 | 105,309 |

### Port Arthur, Tex.

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923.... | 58 | 191,158 | 56 | 188,376 |
| March ..... | 64 | 188,176 | 55 | 169,005 |
| February ..... | 52 | 172,273 | 44 | 142,554 |
| December, 1922 | 59 | 210,778 | 65 | 218,274 |
| November ..... | 42 | 143,551 | 47 | 154,010 |
| October ..... | 68 | 227,039 | 66 | 217,502 |
| September ..... | 53 | 158,181 | 57 | 168,681 |
| August ..... | 69 | 227,941 | 70 | 224,654 |
| July ..... | 88 | 296,956 | 82 | 270,263 |
| June ..... | 81 | 271,752 | 87 | 285,633 |
| May ..... | 90 | 303,623 | 88 | 292,595 |
| April ..... | 90 | 282,288 | 101 | 313,829 |

### Providence

(Exclusive of Domestic)

| Month | —Entrances— No. ships | Net tonnage | —Clearances— No. ships | Net tonnage |
|---|---|---|---|---|
| April, 1923.... | 10 | 33,783 | 12 | 41,352 |
| March ..... | 8 | 31,910 | 8 | 34,367 |
| February ..... | 17 | 56,353 | 10 | 39,840 |
| January ..... | 13 | 45,175 | 12 | 52,651 |
| December, 1922 | 6 | 23,609 | 8 | 29,871 |
| November ..... | 11 | 47,565 | 10 | 31,470 |
| October ..... | 9 | 31,293 | 9 | 31,232 |
| September ..... | 30 | 84,037 | 13 | 40,223 |
| August ..... | 18 | 61,741 | 11 | 38,649 |
| July ..... | 10 | 19,279 | 7 | 22,228 |
| June ..... | 10 | 31,095 | 7 | 17,423 |
| May ..... | 14 | 49,985 | 13 | 37,000 |
| April ..... | 9 | 24,854 | 7 | 31,049 |

## Ore on Dock May 1

Taking May 1 as the opening of navigation, the balance of iron ore on Lake Erie docks this year was 4,857,542 tons. This compares with 6,988,877 gross tons a year ago. On May 1, 1921, the balance was 8,089,216 gross tons; and on May 1, 1920, was 6,192,101 gross tons.

Statistics gathered by MARINE REVIEW from various dock managers at Lake Erie ports show that the total rail shipments from Lake Erie ports to furnaces during the winter season from Dec. 1, 1922 to May 1, 1923, were 5,778,366 gross tons. Winter shipments during 1921-1922 were 2,108,032 gross tons. Last winter shipments were:

| | Gross tons |
|---|---|
| On dock Lake Erie ports, Dec, 1, 1922 | 10,635,908 |
| On dock May 1, 1923 | 4,857,542 |
| By rail to furnaces, winter of 1922-23 | 5,778,366 |

The amount of ore shipped to furnaces by Lake Erie docks during the 1922 navigation season was 28,871,753 gross tons which, added to the winter shipments, give a total of 34,650,119 gross tons of ore forwarded to furnaces over these docks in the year ended May 1, 1923. This total compares with 16,930,796 gross tons moved in the corresponding period ended May 1, 1922; 44,492,879 gross tons in the year ended May 1, 1921; 36,912,569 gross tons in the year ended May 1, 1920, and 48,123,949 gross tons in the year ended May 1, 1919. Port records of ore on docks are:

| Port | Gross tons |
|---|---|
| Buffalo and Port Colborne | 178,576 |
| Erie | 318,585 |
| Conneaut | 876,687 |
| Ashtabula | 1,051,266 |
| Fairport | 215,802 |
| Cleveland | 1,174,406 |
| Lorain | 226,368 |
| Huron | 649,399 |
| Toledo | 166,453 |
| Detroit | ..... |
| Total | 4,857,542 |

William S. Doran, a marine engineer and president of the Alberger Pump & Condenser Co., New York, died May 12.

## Average Ore Cargo

With a heavy demand facing ore carriers on the Great Lakes, this year should witness a new record in the average cargo carried by these bulk freighters. This is true particularly in view of the large number of big, new freighters entering service for the first time this year. The average ore cargo record on the Great Lakes for past years is as follows:

AVERAGE ORE CARGO

| Year | Gross tons | Year | Gross tons |
|---|---|---|---|
| 1922 | 8207 | *1910 | 5593 |
| 1921 | 9398 | 1909 | 7777 |
| 1920 | 8485 | 1908 | 8325 |
| 1919 | 8543 | 1907 | 7516 |
| 1918 | 9371 | 1906 | 6973 |
| 1917 | 8231 | 1905 | 6101 |
| 1916 | 7080 | 1904 | 5272 |
| 1915 | 6841 | 1903 | 5668 |
| 1914 | 6523 | 1902 | 4899 |
| 1913 | 6411 | 1901 | 4459 |
| 1912 | 6244 | 1900 | 3783 |
| 1911 | 5716 | .... | .... |

*D., M. & N. docks only up to 1910. All docks 1910-1922.

## Record of Traffic Through Panama Canal

| | | Atlantic to Pacific traffic —Panama Canal— No. of ships | Net tonnage | Tons of cargo | Pacific to Atlantic traffic —Panama Canal— No. of ships | Net tonnage | Tons of cargo | Total traffic through canal —Panama Canal— No. of ships | Net tonnage | Tons of cargo |
|---|---|---|---|---|---|---|---|---|---|---|
| 1923 March | American | 119 | 635,992 | 348,598 | 96 | 509,443 | 819,204 | 215 | 1,145,435 | 1,167,802 |
| | Foreign | 114 | 505,290 | 329,890 | 80 | 337,467 | 443,236 | 194 | 842,757 | 773,126 |
| | Totals | 233 | 1,141,282 | 678,488 | 176 | 846,910 | 1,262,440 | 409 | 1,988,192 | 1,940,928 |
| February | American | 97 | 486,186 | 325,835 | 82 | 422,871 | 633,458 | 179 | 908,673 | 959,293 |
| | Foreign | 78 | 354,190 | 237,604 | 69 | 266,300 | 366,381 | 147 | 620,874 | 603,985 |
| | Total | 175 | 840,376 | 563,439 | 151 | 689,171 | 999,839 | 326 | 1,529,547 | 1,563,276 |
| January | American | 88 | 450,254 | 313,094 | 67 | 320,300 | 462,245 | 155 | 770,554 | 775,339 |
| | Foreign | 106 | 473,524 | 285,649 | 91 | 366,614 | 530,944 | 197 | 840,138 | 816,593 |
| | Total | 194 | 923,778 | 598,743 | 158 | 686,914 | 993,189 | 352 | 1,610,692 | 1,591,932 |
| 1922 December | American | 78 | 363,857 | 328,924 | 68 | 344,847 | 551,907 | 146 | 710,704 | 880,831 |
| | Foreign | 83 | 352,020 | 231,494 | 75 | 312,539 | 422,777 | 158 | 664,559 | 654,271 |
| | Total | 161 | 717,877 | 560,418 | 143 | 657,386 | 974,684 | 304 | 1,375,263 | 1,535,102 |
| November | American | 65 | 324,783 | 234,500 | 55 | 273,293 | 416,515 | 120 | 598,076 | 651,015 |
| | Foreign | 83 | 370,180 | 266,878 | 91 | 369,024 | 508,967 | 174 | 739,204 | 775,845 |
| | Total | 148 | 694,963 | 501,378 | 146 | 642,317 | 925,482 | 294 | 1,337,280 | 1,426,860 |
| October | American | 70 | 328,229 | 264,171 | 51 | 250,606 | 385,196 | 121 | 578,835 | 649,367 |
| | Foreign | 89 | 384,223 | 300,904 | 84 | 347,334 | 495,592 | 173 | 731,557 | 796,496 |
| | Total | 159 | 712,452 | 565,075 | 135 | 597,940 | 880,788 | 294 | 1,310,392 | 1,445,863 |
| September | American | 54 | 260,249 | 226,741 | 53 | 235,008 | 315,898 | 107 | 495,257 | 542,639 |
| | Foreign | 72 | 322,167 | 241,095 | 61 | 252,986 | 354,454 | 133 | 575,153 | 595,549 |
| | Total | 126 | 582,416 | 467,836 | 114 | 487,994 | 670,352 | 240 | 1,070,410 | 1,138,188 |
| August | American | 58 | 261,613 | 257,674 | 48 | 236,669 | 305,838 | 106 | 498,282 | 563,512 |
| | Foreign | 83 | 350,249 | 299,087 | 68 | 235,602 | 303,351 | 151 | 585,851 | 602,438 |
| | Total | 141 | 611,862 | 556,761 | 116 | 472,271 | 609,189 | 257 | 1,084,133 | 1,165,950 |
| July | American | 52 | 250,378 | 246,471 | 55 | 272,868 | 335,154 | 107 | 523,246 | 581,625 |
| | Foreign | 76 | 323,853 | 295,941 | 68 | 280,772 | 333,534 | 144 | 604,625 | 629,475 |
| | Total | 128 | 574,231 | 542,412 | 123 | 553,640 | 668,688 | 251 | 1,127,871 | 1,211,100 |
| June | American | 57 | 256,060 | 269,098 | 5 | 205,063 | 211,373 | 102 | 461,123 | 480,466 |
| | Foreign | 78 | 338,136 | 317,284 | 8 | 171,454 | 179,728 | 126 | 509,590 | 497,012 |
| | Total | 135 | 594,196 | 586,377 | 93 | 376,517 | 391,101 | 228 | 970,713 | 977,478 |
| May | American | 59 | 285,265 | 343,913 | 49 | 226,356 | 264,626 | 108 | 511,621 | 608,539 |
| | Foreign | 75 | 309,448 | 329,485 | 60 | 211,747 | 220,483 | 135 | 521,195 | 549,968 |
| | Total | 134 | 594,713 | 673,398 | 109 | 438,103 | 485,109 | 243 | 1,032,816 | 1,158,567 |
| April | American | 47 | 220,055 | 260,442 | 48 | 223,913 | 238,420 | 95 | 443,968 | 498,462 |
| | Foreign | 74 | 300,633 | 301,991 | 61 | 230,232 | 245,194 | 135 | 530,865 | 547,585 |
| | Total | 121 | 520,688 | 562,433 | 109 | 454,145 | 483,614 | 230 | 974,833 | 1,046,047 |
| | | Vessels in Ballast | | | | | | | | |
| 1923 March | American | 60 | 359,006 | 0 | 4 | 7,841 | 0 | 64 | 366,847 | 0 |
| | Foreign | 35 | 144,223 | 0 | 3 | 9,915 | 0 | 38 | 154,138 | 0 |
| | Totals | 95 | 503,229 | 0 | 7 | 17,756 | 0 | 102 | 520,985 | 0 |
| February | American | 36 | 229,578 | 0 | 0 | 0 | 0 | 36 | 229,578 | 0 |
| | Foreign | 24 | 105,848 | 0 | 3 | 7,486 | 0 | 27 | 113,334 | 0 |
| | Total | 60 | 335,426 | 0 | 3 | 7,486 | 0 | 63 | 342,912 | 0 |
| January | American | 29 | 181,617 | 0 | 2 | 10,141 | 0 | 31 | 191,758 | 0 |
| | Foreign | 26 | 109,586 | 0 | 1 | 4,942 | 0 | 27 | 114,528 | 0 |
| | Total | 55 | 291,203 | 0 | 3 | 15,083 | 0 | 58 | 306,286 | 0 |

# Late Flashes On Marine Disasters

## Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

| Vessel | Date | Nature | Place | Damage Resulting |
|---|---|---|---|---|
| Anna | Apr. 4 | Collision | off Baltimore | Bow twisted |
| Abbie S. Walker | Apr. 12 | Struck sub. wreck | off Highland Light | Leaking |
| Anahuac | Apr. 16 | On rocks | W. of Biddeford | Rudder & prop. dam. |
| American Star | Apr. 18 | Struck bank | Panama Canal | Leaking |
| Anna M. Hudson | Apr. 19 | Disabled | Tampa | Leaking |
| Augusta G. Hilton | Apr. 22 | Ashore | nr. Jacksonville | Undamaged |
| Annie M. Murphy | May 4 | Ashore | Chandeleaur Island | Total loss |
| Admiral Fiske | May 1 | Ashore | San Diego | Not stated |
| Alpena | May 10 | Grounded | above Belle Isle | Jettis. cargo |
| Bidwell | Apr. 19 | In tow | Chester, Pa. | Not stated |
| Bahada | Apr. 22 | Rammed | San Pedro | Sunk |
| Bayway | Apr. 25 | Grounded | nr. Jacksonville | Undamaged |
| Brush | Apr. 26 | Ashore | nr. Cape Arago | Broke in two |
| Banan | May 1 | Disabled | Norfolk | Eng. dis. |
| Benjamin Van Brunt | May 7 | Collision | off Fouteen Foot Bank | To starboard bow |
| Braddock | Apr. 26 | Gale | off Point Judith | Sunk |
| Brignogan | May 9 | In ice | off Buffalo | Not stated |
| City of Columbus | Apr. 5 | Structural | Boston | Slight leak |
| Competitor | Apr. 6 | Ashore | S. of Nauset Sta. | Not stated |
| Canto | Apr. 12 | Disabled | New York | Not stated |
| Crew Levick No. 5 | Apr. 12 | Sunk | S. - S.W. Fenwick Island | In 11 fathoms water |
| Competitor | Apr. 14 | Ashore | Not stated | Not stated |
| Clam | Apr. 18 | Disabled | Rosebank, S.I. | Water in eng. room |
| Clutha | Apr. 19 | Abandoned | at sea | On fire |
| Coastwise | Apr. 13 | Struck sub. obj. | off Bird Island Flats | Heavy |
| Coahoma County | Apr. 21 | Grounded | Gulfport | Not stated |
| Cymric Queen | Apr. 27 | Ashore and in ice | | |
| Chippewa | May 4 | Disabled | off Charleston | Machy. broke |
| Cairndhu | May 1 | Struck wharf | Quebec | Dent in bow |
| Clare | May 8 | Disabled | New York | Broken windlass |
| Canaova | May 7 | Collision | off Fourteen Foot Bank | Undamaged |
| Canton | Apr. 26 | Gale | off Point Judith | Sunk |
| Dorothy Palmer | Mar. 29 | Ashore | Stone Horse Shoal | Breaking up |
| Daghild | Apr. 3 | Ice | off Halifax | Plates damaged |
| Dustin G. Cressy | Apr. 15 | Collision | SE Black Fish Banks | Not stated |
| Dryden | Apr. 26 | Disabled | Panama Canal | Prop. & tail shaft dis. |
| Eastern King | Apr. 18 | Disabled | New York | Boil. trouble |
| Ellen T. Marshall | Apr. 17 | Ashore | Barrington Bay | Jettis. cargo |
| Elizabeth | Apr. 21 | Fire | Brooklyn | Consider. |
| Equator | Apr. 20 | Disabled | off Point Wilson | Broke crank shaft |
| Elmsport | May 2 | In tow | E of Fire Island | Fuel system broke |
| Ephrata | May 4 | Ashore | Kennebec River | Total loss |
| Fuji Maru | Apr. 11 | Fire | at sea | In No. 5 hatch |
| Frank Brainerd | May 1 | Ashore | nr. Gouldsboro, Me. | May be total loss |
| Frederick H. | May 4 | Struck bottom | Parrsboro, N.S. | Leaking |
| G. Harrison Smith | Apr. 16 | Struck bottom | Panama Canal | Consider. |
| Guy Gordon | Apr. 23 | Sinking Cond. | at sea | Abandoned. |
| Gov. Cobb | May 1 | Grounded | Middle Ground | Not stated |
| Gladys E. Whidden | May 1 | Fell over | Parrsboro | Total loss |
| Gyp | | Struck | Point Medway | Plates damaged |
| Glencarnock | May 7 | Ashore | above Detour | Not stated |
| Glenchard | May 10 | Collision | Russell Island | Not stated |
| Hessen | Apr. 17 | Grounded | Martin's Industry | Jettis. cargo |
| Haiti | May 1 | Fire | New York | To eng. & fire room |
| Halsey | May 7 | Collision | off Staten Island | Damaged |
| Hermion | May 7 | Collision | off Staten Island | Damaged |
| Homer City | May 8 | Fire | New York | Slight |
| Hoover and Mason | May 8 | Collision | Duluth | Unknown |
| Hartnell | May 9 | Disabled | Lake Superior | Steerer trouble |
| Indiana | Apr. 10 | Struck object | at sea | Lost prop. blade |
| Iethou | Apr. 3 | Collision | nr. Hamburg | To starboard & mast |
| I. Oswald Boyd | Apr. 7 | Ashore | not stated | Lost prop. & leak. |
| Johan Ludvig Mowinchel | May 6 | Leaking | Savannah | Cargo damaged |
| James Laughlin | May 7 | Ashore | Squaw Island | Not stated |
| J. T. Hutchinson | May 12 | Ashore | nr. Midland | Not stated |
| Kishacoquilla | Apr. 21 | Grounded | Santa Rosa Island | Floated |
| La Provence | May 1 | Disabled in ice | off Louisburg, CB | Prop. broke |
| Lake Gebhart | May 9 | Ashore | Washington coast | Break up |
| Lorene | May 9 | Grounded | off Cataba Island | on rocks |
| Mackaweli | Mar. 29 | Disabled | San Pedro | Leaking |
| Mary H. Diebold | Apr. 6 | Collision | Sandy Hook Bay | Bow damaged |
| Maasburg | Apr. 20 | Disabled | off Scilly | Prop. blade broke |
| Mary E. Foster | Apr. 20 | Collision | Waikiki | Damaged, ashore |
| Mauna Kea | Apr. 20 | Collision | Waikiki | Undamaged |
| Madison | Apr. 13 | Disabled | New York | Windlass jammed |
| Mabel Gale | Apr. 24 | Grounded | Dutch Island | Not stated |
| Mossamedes | Apr. 23 | Grounded | Cape Frio, SW Africa | Abandoned |
| Mursa | Apr. 28 | Grounded | Yokohoma | Undamaged |
| Muria | May 6 | Fire | 350 m. E. of Ambrose | No. 1 hold |
| Manhattan Island | May 9 | Grounded | Chanak | Not stated |
| Mackaweli | Apr. 26 | Disabled | at sea | Sails gone |
| M.C. Elphicke | May 7 | Disabled | Soo | Wheel broke |
| Maricopa | May 10 | Hit dock | Conneaut | Rudder damage |
| Nishmaha | Apr. 13 | Disabled | Bermuda | Defective pump & steerer |
| Newton | Apr. 13 | Grounded | West Chop | Not Stated |
| Ohio | Apr. 15 | Disabled | New York | Eng. trouble |
| Oswego | May 3 | Fire | Port Arthur | Slight |
| Penrhys | Apr. 4 | Collision | off Baltimore | Plates dented |
| Penobscot | Apr. 15 | Collision | SE Black Fish Bank | Slight |
| Pa. R. R. No. 473 | Apr. 4 | Collision | Jersey City | Not stated |
| Pawnee | Apr. 22 | Struck sub. wreck | Jacksonville | Prop. damaged |
| Point Judith | Apr. 20 | Disabled | Seattle Harbor | Broke rudder |
| Price McKinney | May 8 | Disabled | Soo | Machy. trouble |
| Philip Minch | May 10 | Hit Jetty | Ashtabula | Plates damaged |
| Rockhaven | Apr. 12 | Ashore | Isleboro | Not stated |
| Robert Lewers | Arp. 11 | Ashore | Cape Beale | Breaking up |
| Robert W. Pomeroy | Apr. 27 | Ashore | nr. Swansea | Unknown |
| Rolf | May 5 | Disabled | New York | Leaking |
| Raymond | May 1 | Struck iceberg | 200 m. E. of Flemish | Sunk |
| Stroudsburg | Apr. 13 | Sunk | off Cape May | Not stated |
| Shawmut | Apr. 21 | Disabled | off Bayonne | Broke crank shaft |
| Steelore | Apr. 18 | Touched bottom | Panama Canal | Floated |
| Stranger | Apr. 24 | Fire | at sea | Total loss |
| Seaconnet | May 5 | Disabled | Naushon Island | In tow |
| Steel Voyager | May 2 | Collision | New Orleans | Damaged |
| Sinaloa | May 5 | Grounded | Erie | Not stated |
| Susquehanna | May 1 | Struck bank | Panama Canal | Not stated |
| Smith Thompson | May 7 | Ashore | Squaw Island | Heavy |
| T.L. Church | Apr. 4 | Disabled | Charleston | Boil. dam. |
| Turrialba | Apr. 7 | Disabled | New York | Leak. |
| Trontolite | Apr. 11 | Struck bank | Panama Canal | Plating caulked |
| Tapajo | Apr. 18 | Disabled | at sea | Not stated |
| Tamara X | Apr. 19 | Disabled | St. Michaels | Dismasted |
| Thelma | Apr. 29 | Grounded | nr. Chalkmount | Breaking up |
| Taunton | Apr. 26 | Gale | off Point Judith | Sunk |
| Thomas Walters | May 8 | Collsion | Duluth | Plates bent |
| Victory | Apr. 19 | Fire | Buffalo | Slight |
| Vulcan City | Apr. 23 | Disabled | off Dover | Eng. dis. |
| Varg | May 1 | Ashore | below New Orleans | Not stated |
| West Helix | Mar. 13 | Disabled | at sea | Eng. dis. |
| West Camak | Apr. 14 | Fire | nr. Rio Janeiro | Not stated |
| William H. Draper | Apr. 14 | Disabled | Camocin | Jettis. cargo |
| Well Sley | Apr. 16 | In tow | SW Northeast End Light | Foundered |
| Wisdom II | Apr. 11 | Fire | Savona | Not stated |
| Weert | Apr. | Grounded | Pass aux Herons | Undamaged |
| W. H. Truesdale | May 12 | Ashore | Gull Island | Leaking |
| W.P. Snyder Jr | May 10 | Collision | Russell Island | Plates damaged |

## Will Sample Coal

Inspection and sampling of coal purchased by the shipping board in New York for its steamship lines will now be done by the department of the interior through its bureau of mines. The work will include sampling of foreign coal remaining in bunker upon the arrival of these ships in New York as well as sampling the coal while it is being loaded on these vessels in the New York port.

## Obituary

John Gilbert Ward, treasurer of Babcock & Wilcox Co., New York, for the past 30 years, died at his home in Glen Ridge, N. J., on April 12. He was born in Cuba on July 12, 1854, where his father, an Englishman, had settled. His mother was a Cuban. Mr. Ward's early life was passed in Delaware. He became connected with Babcock & Wilcox Co. in 1888, as a clerk in the treasurer's office, and in 1893 he was elected a director and treasurer of the company, both of which offices he held until the time of his death. Mr. Ward was a member of a number of prominent clubs.

## Shipping Board Sales

The steamer WEST TOTANT, 8649 deadweight tons, has been assigned by the shipping board to A. H. Bull & Co., New York, for their West African service.

HALIBA, steel tanker, 10,238 deadweight tons, 7235 gross tons, to the Union Oil Co. of California, Los Angeles.

ARGUS, steel cargo, 9607 deadweight tons, 6094 gross tons, to the McCormick Intercoastal Steamship Co., San Francisco.

LAKE FANNIN, lake type cargo, 4155 deadweight 2649 gross tons, to the Clyde Steamship Co., New York.

LAKE GILBOA, lake type cargo, 4155 deadweight tons, 2664 gross tons; to the Clyde Steamship Co., New York.

BARACCA, lake type cargo, 4255 deadweight tons, 2599 gross tons, to the Clyde Steamship Co., New York.

BOGOTA, lake type cargo, 4155 deadweight tons, 2627 gross tons, to the Gulf & Southern Steamship Co., New York.

BOLIVAR, lake type cargo, 4155 deadweight tons, 2606 gross tons, to the Gulf & Southern Steamship Co., New York.

BRIDGETOWN, lake type cargo, 4095 deadweight tons, 2559 gross tons, to the Gulf & Southern Steamship Co., New York.

MARTINIQUE, lake type cargo, 4095 deadweight tons, 2559 gross tons, to the Gulf & Southern Steamship Co., New York.

BARKHAMSTEAD, steel ocean-type tug, 429 gross tons, to the Pringle Barge Line Co., Cleveland.

DILLWYN, steel tanker, 10,000 deadweight tons, 7045 gross tons, to the Malston Co., Inc., New York.

HALSEY, steel tanker, 10,078 deadweight tons, 7225 gross tons, to the Malston Co., Inc., New York.

DURANGO, steel tanker, 10,078 deadweight tons, 7257 gross tons, to the Malston Co., Inc., New York.

DUNGANNON, steel tanker, 10,078 deadweight tons, 7257 gross tons, to the Texas Co., New York.

DERBYLINE, steel tanker, 10,000 deadweight tons, 7063 gross tons, to the Texas Co., New York.

PORTOLA PLUMAS, steel tanker, 10,078 deadweight tons, 7076 gross tons, to the Pure Oil Steamship Co., Philadelphia.

CITY OF ALAMEDA, steel tanker, 10,000 deadweight tons, 7044 gross tons, to the Pure Oil Steamship Co., Philadelphia.

ARTS, steel cargo, 9605 deadweight tons, 6094 gross tons, to Charles R. McCormick & Co., San Francisco.

HAMWAC, steel tanker, 9980 deadweight tons, to the General Petroleum Co., New York.

HALO, steel tanker, 10,078 deadweight tons, to the City Service Co., New York.

TUSTEM, steel tanker, 9799 deadweight tons, to the Atlantic Refining Co., Philadelphia.

BOHEMIAN CLUB, steel tanker, 9798 deadweight tons, to the Atlantic Refining Co., Philadelphia.

DEVOLENTE, steel tanker, 10,000 deadweight tons, to the Beacon Oil Co., New York.

RICHCONCAL, steel tanker, 10,078 deadweight tons, to the Beacon Oil Co., New York.

WARWICK, steel tanker, 6008 deadweight tons, to the Union Oil Co. of California.

DEROCHE, steel tanker, 10,000 deadweight tons, to the Union Oil Co. of California.

CASTLEWOOD, steel cargo, 5147 deadweight tons, 3304 gross tons, to the Charles Nelson Co. and Charles R. McCormick & Co., San Francisco.

CASTLEPOINT, steel cargo, 5143 deadweight tons 3260 gross tons, to the Charles Nelson Co. and Charles R. McCormick & Co., San Francisco.

CASTLETOWN, steel cargo, 5141 deadweight tons, 3328 gross tons, to the Charles R. Nelson Co. and Charles R. McCormick & Co., San Francisco.

WALLINGFORD, steel cargo, 3390 deadweight tons, 2256 gross tons, to the Charles Nelson Co. and Charles R. McCormick & Co., San Francisco.

MAGUNKOOK, steel cargo, 6000 deadweight tons, 4029 gross tons, to the Moore Dry Dock Co., San Francisco.

LUBRICO, steel tanker, 9815 deadweight tons, 6002 gross tons, to the Standard Oil Co. of California, San Francisco.

NAGOOD, steel tanker, 10,238 deadweight tons, 6972 gross tons, to the Cities Service Co., New York.

EASTERN KNIGHT, steel cargo, 10,350 deadweight tons, 6588 gross tons, to the Columbia Pacific Shipping Co., Portland, Oreg.

LAKE STRYMON, steel cargo, 4143 deadweight tons, 2609 gross tons, to the Southern Steamship Co., Philadelphia.

LAKE ELSMERE, steel cargo, 4261 deadweight tons, 2674 gross tons, to the Southern Steamship Co., Philadelphia.

LIBERTY MINQUAS, steel tanker, 7540 deadweight tons, 5056 gross tons, to the American Petroleum Co., Houston, Tex.

SALEM COUNTY, steel tanker, 7540 deadweight tons, 5056 gross tons, to the Galena Navigation Co., Houston, Tex.

HUGOTON, steel tanker, 10,387 deadweight tons, 7009 gross tons, to the Malston Co., Inc., New York.

DANVILLE, steel tanker, 6008 deadweight tons, 4510 gross tons, to the Argentine republic.

LAKE GEBHART, lake-type cargo, 4155 deadweight tons, 2810 gross tons, to the Alaska Steamship Co., New York.

HAHATONKA, steel tanker, 10,238 deadweight tons, 6972 gross tons, to the Gulf Refining Co., Pittsburgh.

HALWAY, steel tanker, 10,078 deadweight tons, 7216 gross tons, to the Gulf Refining Co., Pittsburgh.

ANTIETAM, steel tanker, 10,238 deadweight tons, 6972 gross tons, to the David Berg Industrial Alcohol Co., Philadelphia.

## April Ore Shipments

The ice blockade at the Soo prevented any ore cargoes being shipped from Lake Superior ports in April. Late in the month, two vessels cleared from Escanaba, giving the following total of ore shipments for April:

| | Gross Tons — Apr., '23 | Apr., '22 |
|---|---|---|
| Escanaba | 14,184 | 40,219 |
| Marquette | ..... | ..... |
| Ashland | ..... | 24,55 |
| Superior | ..... | 52,387 |
| Duluth | ..... | 19,000 |
| Two Harbors | ..... | ..... |
| Total | 14,184 | 136,161 |
| 1923 decrease | 121,977 | |

## Iron Ore Traffic on the Great Lakes

Opening of the 1923 navigation season on the Great Lakes, while delayed by ice blockades, introduces a year which promises to be one of the most successful enjoyed by lake operators for some time. The immense bulk freight traffic handled on the Great Lakes can be gaged by the following records which give the principal facts concerning the iron ore trade during the past six years. While iron ore supplies greater part of the bulk freight movement, coal, grain, and stone shipments also are carried in large volume.

**IRON ORE ON LAKE ERIE DOCKS DEC. 1, GROSS TONS**

| | 1922 | 1921 | 1920 | 1919 | 1918 | 1917 |
|---|---|---|---|---|---|---|
| Toledo | 290,986 | 347,905 | 336,609 | 332,051 | 399,839 | 399,479 |
| Huron | 886,248 | 699,850 | 733,297 | 698,927 | 607,233 | 556,765 |
| Lorain | 543,112 | 769,840 | 1,143,515 | 777,803 | 828,384 | 978,108 |
| Cleveland | 2,510,764 | 1,367,589 | 1,791,921 | 2,078,201 | 2,117,176 | 1,914,071 |
| Fairport | 466,310 | 340,927 | 498,704 | 528,360 | 510,855 | 536,580 |
| Ashtabula | 2,951,395 | 2,742,617 | 3,552,503 | 3,429,258 | 3,292,738 | 3,435,624 |
| Conneaut | 2,098,787 | 1,914,045 | 2,059,193 | 1,850,759 | 1,703,701 | 1,544,706 |
| Erie | 626,967 | 601,661 | 374,363 | 405,761 | 439,094 | 519,698 |
| Buffalo | 261,339 | 312,475 | 440,749 | 355,194 | 525,947 | 441,318 |
| Total | 10,635,908 | 9,096,909 | 10,930,854 | 10,456,314 | 10,424,967 | 10,326,349 |

**IRON ORE RECEIPTS AT LAKE ERIE PORTS, GROSS TONS**

| | 1922 | 1921 | 1920 | 1919 | 1918 | 1917 |
|---|---|---|---|---|---|---|
| Detroit | 803,482 | 269,488 | 813,381 | 549,096 | 444,936 | 418,151 |
| Toledo | 1,227,351 | 411,147 | 2,654,957 | 1,536,437 | 2,608,497 | 2,445,602 |
| Huron | 654,575 | 553,807 | 1,421,509 | 1,134,104 | 1,620,712 | 1,631,395 |
| Lorain | 2,780,123 | 1,788,175 | 4,045,286 | 3,379,421 | 3,494,370 | 3,831,244 |
| Cleveland | 7,991,162 | 2,565,902 | 7,865,757 | 7,466,921 | 9,681,882 | 9,077,161 |
| Fairport | 1,032,797 | 1,340,017 | 1,247,964 | 1,952,635 | 1,853,465 | 2,311,179 |
| Ashtabula | 7,740,105 | 2,001,806 | 11,028,518 | 8,377,277 | 11,001,574 | 10,251,304 |
| Conneaut | 6,550,681 | 5,329,396 | 5,989,763 | 7,056,882 | 6,650,898 | 8,729,754 |
| Erie | 666,288 | 386,836 | 2,218,706 | 1,102,478 | 1,809,619 | 2,079,227 |
| Buffalo | 3,847,189 | 1,160,639 | 8,196,981 | 4,649,008 | 8,845,775 | 7,843,215 |
| Port Colborne | 25,031 | 23,244 | 187,172 | 219,326 | 171,287 | 194,627 |
| Total | 32,518,784 | 15,830,457 | 45,669,994 | 37,423,585 | 48,183,015 | 48,812,859 |

**IRON ORE SHIPMENTS FROM UPPER LAKE PORTS, GROSS TONS**

| | 1922 | 1921 | 1920 | 1919 | 1918 | 1917 |
|---|---|---|---|---|---|---|
| Escanaba | 4,592,354 | 1,806,656 | 7,361,070 | 4,963,358 | 6,774,969 | 7,156,854 |
| Marquette | 1,976,220 | 786,946 | 3,415,108 | 2,132,935 | 3,457,054 | 3,207,145 |
| Ashland | 5,813,207 | 2,264,705 | 8,180,852 | 5,915,383 | 7,565,008 | 7,597,841 |
| Superior | 11,234,195 | 4,991,278 | 14,812,398 | 10,919,968 | 14,068,341 | 13,978,741 |
| Duluth | 13,044,771 | 9,164,803 | 15,479,334 | 16,821,209 | 20,567,288 | 20,567,419 |
| Two Harbors | 5,952,437 | 3,286,338 | 9,278,464 | 6,424,545 | 8,723,472 | 9,990,901 |
| Total | 42,613,184 | 22,300,726 | 58,527,226 | 47,177,395 | 61,156,732 | 62,498,901 |

**IRON ORE RECEIPTS AT LAKE MICHIGAN PORTS, GROSS TONS**

| | 1922 | 1921 | 1920 | 1919 | 1918 | 1917 |
|---|---|---|---|---|---|---|
| South Chicago | 5,000,871 | 2,665,318 | 6,280,521 | 4,670,054 | 6,113,492 | 7,030,174 |
| East Jordan, Mich. | 17,873 | 10,892 | 14,452 | 32,706 | 33,940 | 35,792 |
| Boyne City, Mich. | 3,695 | ..... | 30,053 | 47,061 | 34,137 | 44,437 |
| Milwaukee | 27,040 | 20,654 | 129,039 | 133,220 | 166,626 | 224,570 |
| Indiana Harbor, Ind. | 1,145,596 | 779,478 | 1,264,114 | 1,150,683 | 1,413,392 | 900,692 |
| Gary, Ind. | 2,894,382 | 2,362,336 | 3,675,005 | 2,509,338 | 3,848,295 | 3,883,082 |
| Total | 9,089,457 | 5,838,678 | 11,393,184 | 8,543,062 | 11,609,882 | 12,116,747 |

# Equipment Used Afloat, Ashore

## Swinging Furnace Front — Pressure Regulating or Reducing Valves—New Method of Cleaning Boilers—Welding Generator

A NEW type of swing furnace front has recently been developed by the Bethlehem Shipbuilding Corp., Ltd., Bethlehem, Pa., for use in installations of its mechanical oil burning systems, known as the Dahl type, which are manufactured at its Moore plant, Elizabeth, N. J.

This front is suitable for use with either natural or forced draft, or with a combination of both. The swinging feature of the new front, in addition to retaining all of the desirable features of the nonswinging type, possesses special advantages in regard to accessibility and air regulation.

The air register is a substantial cylindrical casting having nine air vanes cast intergral with two flanges of rugged design, the front one of which acts as a support for the swinging part, the rear one being bolted to the boiler furnace front. A cylindrical regulating pot air check governs the amount of air admitted by opening and closing the air inlet. The air regulating pot is controlled by means of a hand operated rack and pinion.

The cylindrical air regulating pot and air regulation pot head are separate castings, clamped together by two dogs. The air controlling gear and cone adjusting gear are the same in both swinging and nonswinging types.

The swinging front permits of air regulation when working under natural draft, forced draft, or combined natural and forced draft, and under all conditions of operation, it may be swung open to permit of easy access to the furnace interior without dismantling any part of the boiler front. When working on natural draft installation, the cylindrical air regulating pot, and air regulation pot head are one casting. Regulation of the air is accomplished by adjusting the air regulation pot. In this case, the air is admitted through the register vanes which are open to the boiler room.

### Ease of Inspection

Withdrawing the pot and pot head along a cylindrical bracket placed in the center of the crossbar, by means of the rack and pinion, and swinging them open, permits of inspection and easy access to the interior of the furnaces without dismantling the boiler front or fuel oil piping.

When operating under forced draft, the register is enclosed by the air duct, and adjustment for air control is by means of the rack and pinion which operates the air regulating pot and pot head. Closing the air regulating pot over the register vanes, cuts off the forced draft and permits of swinging the air regulating pot head, burner, and regulating cone clear of the register for inspection without destroying draft conditions on other furnaces being supplied from the same duct. The swinging clear of the pot head and door frame permits of inspection and access to the furnaces without dismantling the furnace front or fuel oil piping. To do this, the two dogs are thrown clear of the air regulating pot, the latch bolt is disconnected and the air regulation pot head is withdrawn from the air regulating pot. While these various movements are taking place, the air regulating pot seals the register thus preventing leakage of air during examination of the burner and regulating cone.

When working under natural draft on a combined forced and natural draft installation, the air regulation pot remains in the closed position shown in Fig. 2 of the accompanying illustra-

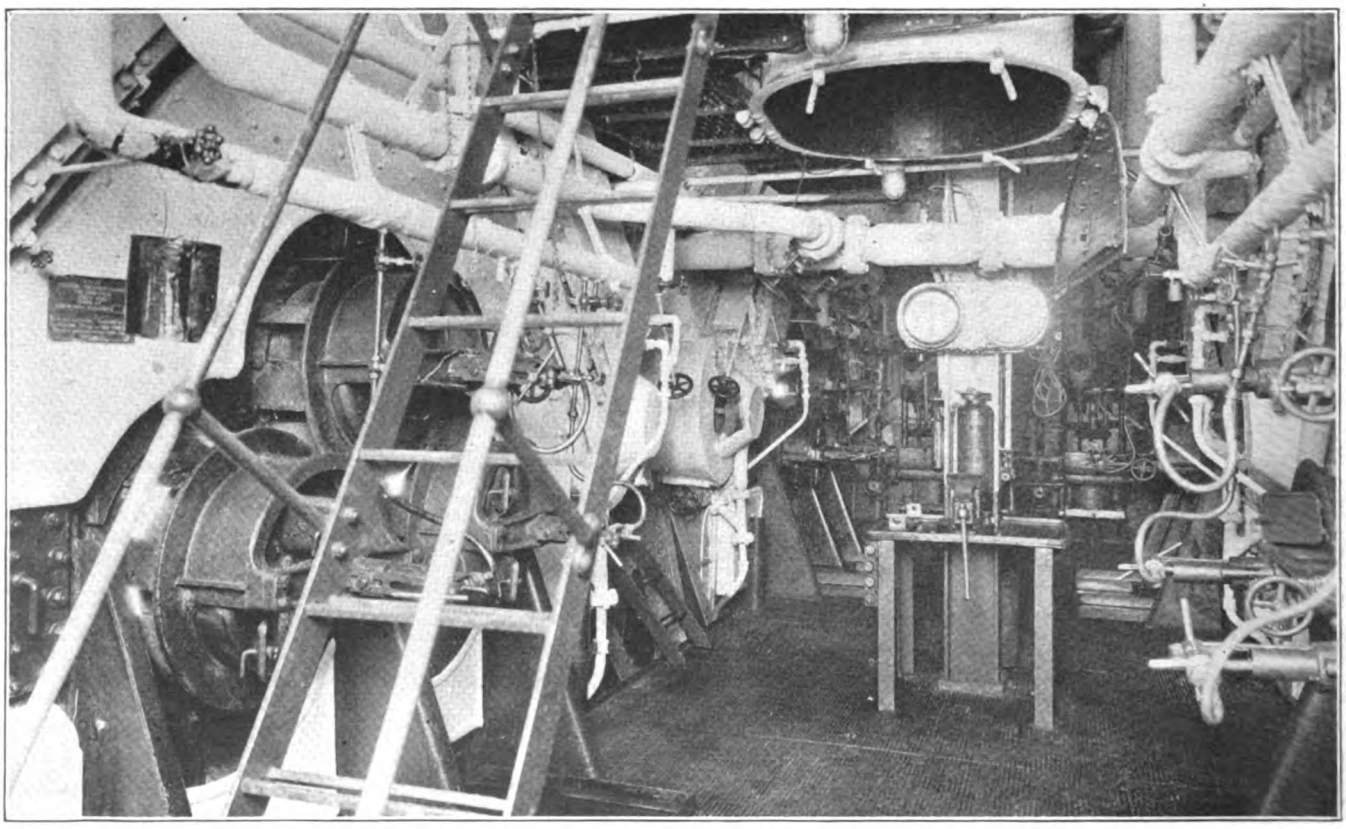


FIG. 1—FIRE ROOM OF AMERICAN LINER PAN AMERICA SHOWING BOILERS WITH BETHLEHEM OIL-BURNING SYSTEM

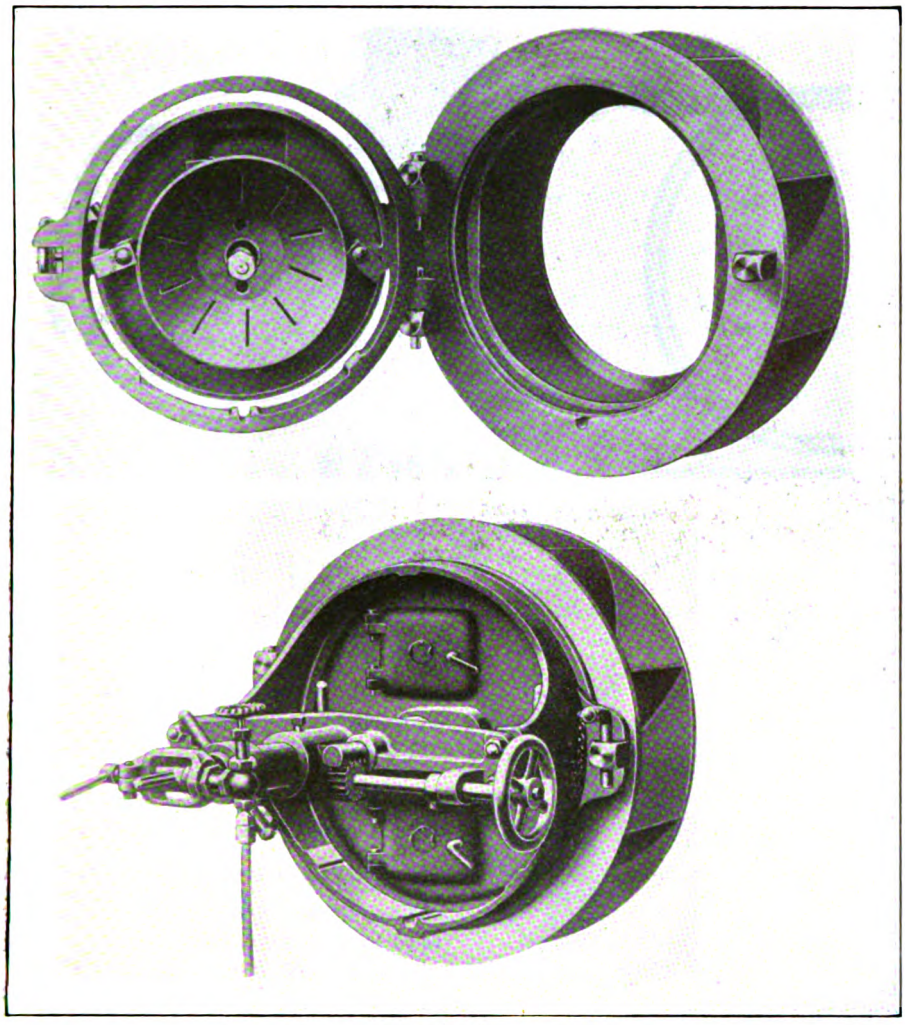


FIG. 2—SWINGING TYPE FURNACE FRONT FOR NATURAL OR FORCED DRAFT INSTALLATIONS. UPPER VIEW SHOWS OPEN POSITION WITH AIR REGULATING POT IN CLOSED POSITION AND REVEALS THE EASE OF ACCESS TO THE FURNACE INTERIOR. LOWER VIEW SHOWS THE OPERATING POSITION

tions, shutting off the forced draft through the air duct. The two dogs are disconnected and the air regulating pot head is withdrawn for the admission of air, by means of the hand operated rack and pinion, thus giving a definite air control.

If for any reason, it is found desirable to admit a still greater quantity of air, the two doors in the air regulating pot head can be opened. Access to the interior of the furnace is obtained as described above.

A number of installation of this design of furnace front have already been made. It is said to give excellent results since the design was chosen to insure ease of operation, flexibility of control of air regulation, complete atomization and high efficiency. Fig. 1 shows the installations of the fixed type of furnace front of this system, on the American liner PAN AMERICA.

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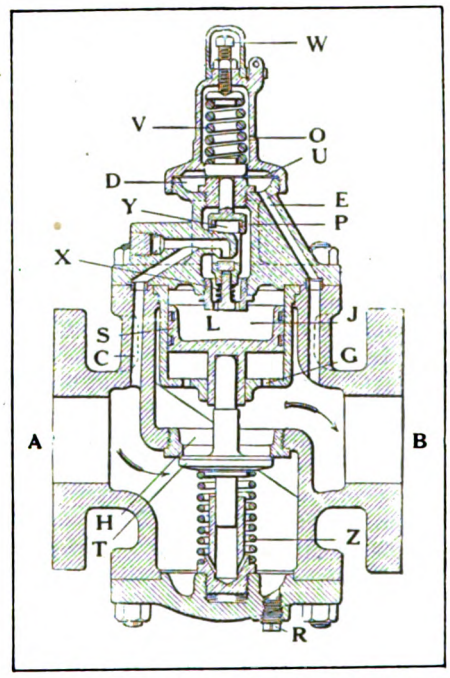
CAPT. V. F. SPARKS has taken command of the cable steamer RESTORER.

## Pressure Regulating or Reducing Valves

For any steam plant on board ship, it is desirable to have the boilers and main engines, whether reciprocating or turbine, designed for the highest practical steam pressures. Working steam pressure at the boilers will vary in ordinary practice from 175 to 250 pounds per square inch. The pressure most commonly used today is in the vicinity of 200 pounds.

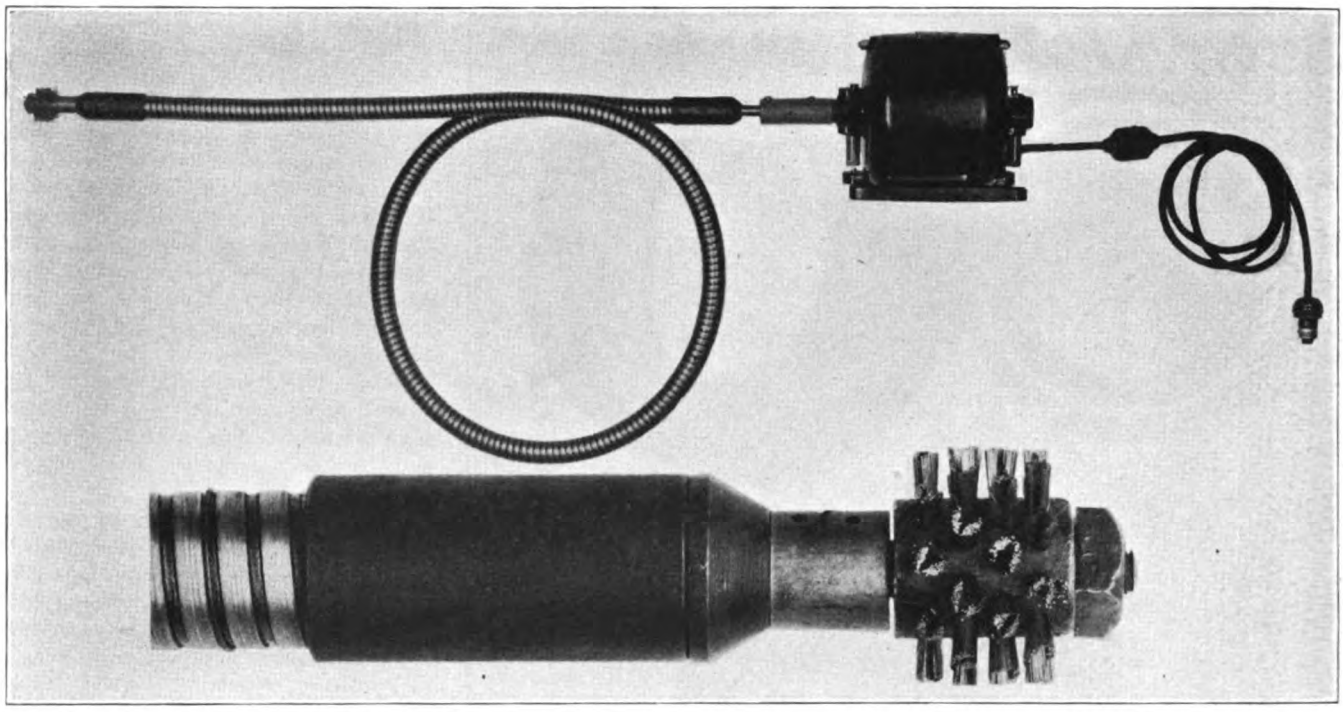
Steam for the main drive is taken directly from the boilers at full boiler pressure by means of the main steam line or lines. On board all ships, however, a secondary use exists for steam from the main boilers, that is for driving various auxiliaries. These auxiliaries may be divided into three groups: 1, engine room auxiliary; 2, refrigerating machine; 3, deck machinery. The auxiliary steam lines take steam directly from the boilers for use in driving the units in the above groups. The majority of these units can not, however, use the steam at full boiler pressure and it is, therefore, necessary to reduce or regulate the pressure to a suitable amount. In the layout of the auxiliary steam system, it is best to have all the necessary main feeders. For instance, it is advisable to run an independent line not only to each of the principal divisions but also to important units. In general, there should be an independent line to each of the following: the windlass, steering engine, deck winches forward, deck winches aft, engine room auxiliaries and refrigerating machine. The fuel oil service and heating systems also require steam lines.

As it is not practicable to use the full boiler pressure for these auxiliaries, the steam pressure must be reduced and regulated as necessary by placing in each main branch line a valve for this purpose. A reducing or pressure regulating valve should be simple in design and of rugged construction and should give accurate reduction or control so that when




SECTION THROUGH PRESSURE REGULATING VALVE

*A*—Inlet
*B*—Outlet
*C*—Controlling Port
*D*—Diaphragm Chamber
*E*—Port to Diaphragm Chamber
*G*—Equalizing Ports
*H*—Main Valve Opening
*J*—Piston Chamber
*L*—Ports from Auxiliary to Piston Chamber
*O*—Tell Tale Port
*P*—Auxiliary Valve Chamber
*R*—Drain (should be piped to trap)
*S*—Piston
*T*—Main Valve
*U*—Diaphragm
*V*—Adjusting Spring
*W*—Spring Adjusting Screw
*X*—Auxiliary Valve Spring
*Y*—Auxiliary Valve
*Z*—Main Valve Spring



COMPLETE BOILER TUBE CLEANER (ABOVE) COMPRISING WIRE BRUSH, CHUCK, FLEXIBLE SHAFTING, COUPLING, MOTOR AND ELECTRIC CABLE WITH ORDINARY LIGHT SOCKET. (BELOW) STEEL WIRE BRUSH AND CHUCK IN DETAIL

once set the delivery pressure will remain constant. Serious difficulties may arise from carelessly regulated or poorly working valves.

The accompanying illustration shows a cross section of a 2½-inch and larger pressure regulator valve as constructed by the Foster Engineering Co., Newark, N. J. This valve is capable of reducing 300 pounds per square inch and somewhat higher, to from zero pressure to within 15 per cent of the initial pressure. It is single seated, auxiliary operated, has only one small diaphragm and if carefully applied is capable of regulating the pressure closely, within one pound or so. The slight movement required of the auxiliary valve, which is the controlling feature, with instantaneous response, makes it work well for loads subject to sudden fluctuation.

This valve will work equally well in any position as long as the inlet and outlet are properly connected. There are no outside parts. It is entirely self-contained and only one adjusting spring is used. Other advantages pointed to are the removable piston cylinder and the interchangeability of parts. A wide range of pressures on the delivery side is possible with the single adjusting spring and diaphragm. The design follows modern engineering practice, so that with its rugged construction little chance exists of the valve getting out of order. In sizes from ½ to 2 inches the material used is all composition, from 2½ inches and larger, the body is iron. Steam, air or water under pressure may be controlled with this valve.

In operation, steam entering at *A* passes through the main valve port *H* and out to the outlet *B*. The initial pressure acts through the passage *C*, enters chamber *P* and thence to the top of piston *S* through ports *L* thereby opening the main valve *T*. The delivery pressure, passing through the port *E* raises the diaphragm *U* against the pressure spring *V* and allows the spring *X* to close the auxiliary valve *Y*. The pressure in chamber *J* is then equalized by the reduced pressure passing through ports *G* to the underside of the piston *S* and this allows the spring *Z* to close the main valve, which is then held to its seat by the initial pressure.

Upon any reduction of the delivery pressure acting on the diaphragm, the spring *V* forces it down and opens the auxiliary valve *Y* admitting steam to the top of piston *S* as before explained.

The delivery pressure is controlled by adjusting screw *W*, tightening the tension of spring *V*, increases the discharge pressure or vice versa. After having once made the adjustment, the delivery pressure will remain constant regardless of any change in volume of discharge or initial pressure, so long as the latter remains in excess of the delivery pressure. Turning to the right increases and to the left decreases the delivery pressure.

## Use New Method to Clean Leviathan's Boilers

When serious attention was finally directed to the reconditioning of the LEVIATHAN after numerous surveys and inspections and plans were ready and the money appropriated, the time came for action. It devolved on the men chosen to supervise and carry on this work to get down to particular cases.

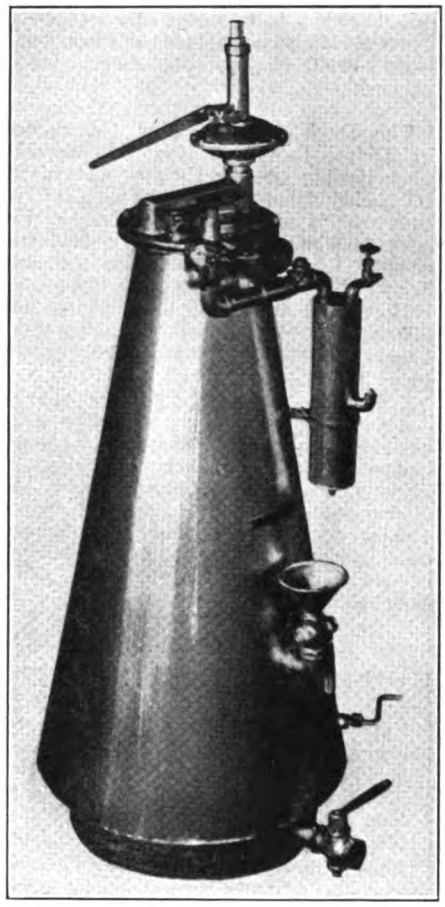
Among the many practical problems which the engineering representatives, Messrs. Alexander and Harrison of Gibbs Bros., Inc., New York were called upon to solve on board the LEVIATHAN at the yard of the Newport News Shipbuilding & Drydock Co., was that of thoroughly cleaning the boilers. The problem was complicated by the fact that these boilers are of the modified Yarrow type with comparatively small diameter tubes, many of which have severe and abrupt bends. Any cleaning these tubes had received during the LEVIATHAN'S tenure as a troopship, operated by the navy, as far as any records available indicate, had been done, in so far as it was done at all, by slow, laborious and unsatisfactory hand methods probably by drawing through the tubes flexible wire with a few links of chain or a small wire brush on the end. At any rate, Messrs. Alexander and Harrison found no apparatus on board for doing this work efficiently and economically. They however, did find on board several sections of flexible shafting, evidently left on board from the time of the operation of

this ship by the Germans. Nothing complete was found, but from the fragments that were picked up, the deduction was made that flexible shafting attached to a small electric motor on one end and with a steel wire brush on the other, had been used for cleaning the boiler tubes.

With this as a basis, Gibbs Bros. Inc., called on the S. S. White Dental Mfg. Co., 84 Market street, New York, as a recognized manufacturer of flexible shafting, to furnish the necessary equipment. A number of experiments with a wire brush of special design already made indicated that a method of this kind would be practicable. After considerable further experimentation, the accessories division of the S. S. White Dental Mfg. Co., made up flexible shaft drives using an inner core of ½ inch diameter and an outer casing of 1 inch diameter measuring 21 feet over all. One end was fitted with a short length of solid shaft so that it could be attached to a coupling on the shaft of a ½ horsepower motor and the other end was fitted with a special chuck for holding the shank of the wire brush. The accompanying illustration shows the complete cleaner and also the steel wire brush and chuck in detail.

The modified Yarrow type boilers on the LEVIATHAN are made up of an upper drum and two lower drums, with tubes 1¾ inch outside diameter and 1½ inch inside diameter and about 14 feet in length. The outer rows coming in to the upper and lower drums approximately normal to the cylindrical surface, have quite abrupt bends. In all, 46 of these boilers are on the LEVIATHAN, each with 1040 tubes or a total of 47,840. In the actual cleaning of the boilers, the whole outfit (motor and flexible shafting) was placed inside of the upper drum, the motor near the man hole end, and the flexible shafting was supported by two workmen. The brush was pushed down through each tube and then drawn back. The brush by means of the motor through the flexible shafting revolved at 1800 revolutions per minute. This rapid rotary motion of the steel wire brush served to ease the travel through the tube and thoroughly cleaned out the dirt and scale incrustations forcing them into the lower drum. All of the work was done under dry conditions, and with this apparatus a crew of three men cleaned a boiler in from one to two days. Furthermore, when the job was done the boiler was thoroughly clean. The scale and dirt to the amount of several buckets was removed from the lower drum at the end of the operation. As finally designed, the outfit was capable of long service, the only wear and tear being on the brushes. A number of brushes were needed for cleaning out each boiler.

Where cleaning is concerned, the boilers of the LEVIATHAN represent about the most difficult conditions, with the exception of the express type Yarrow boilers installed in a few passenger vessels. To meet the problem in tubes of smaller than 1½ inch inside diameter, the flexible shafting diameter may be reduced, and the nonflexible portion, the chuck and brush, can be somewhat reduced in length. There is, however, a limit and it is possible that in some instances the apparatus will only be able to take care of about 90 per cent of the tubes and the remaining with severe bends may have to be cleaned by hand.



PORTABLE ACETYLENE WELDING GENERATOR

Apart from those boilers that have small diameter bent tubes, this method can be, it seems, applied as a thoroughly efficient and rapid mechanical method of doing the brushing of boiler tubes both in the Scotch fire tube and the smaller and larger straight tube water tube boilers of the usual marine types. The present method of brushing by hand is slow and laborious and what is of still more importance, does not give a really clean tube. By the rotating brush method, every portion of the tube is effectively brushed. The importance of thoroughly clean tubes can not be over estimated both in regard to steaming efficiency and life of boiler. By cleaning the tubes mechanically, the work can be done quickly and no time is lost from operation, nor does the ship suffer through neglect due to lack of time to do this work by the slow hand method.

## New Welding Generator

The Alexander Milburn Co., Baltimore, manufacturer of oxyacetylene welding and cutting equipment, has recently developed a portable acetylene welding generator designed to obviate the use of high pressure cylinders. The generator is of 30 pounds carbide capacity, or the equivalent of 150 cubic feet of cylinder gas. It is said to be simple to operate, has few parts, operates automatically with no clock or motors. The steel body is welded throughout with all parts readily accessible.

## Newport News Yard To Repair Big Liner

On May 3, the shipping board awarded the contract for reconditioning the PRESIDENT BUCHANAN to the Newport News Shipbuilding & Drydock Co., Newport News Va., at a contract price of $3,990,000. The selection of a successful bidder lay between the Newport News yard and the Brooklyn navy yard. As the estimate offered by the navy yard was so close to the firm bid of the private yard, the shipping board believed that the best course to follow would be to make the award to the Newport News shipyard with the certainty of final cost. It was feared that the navy yard might find it necessary to spend considerably more than the estimate submitted. The PRESIDENT BUCHANAN was formerly the German-built PRESIDENT GRANT of the Hamburg-American line and will be reconditioned as a one cabin vessel. Upon completion, she will be assigned to the United States line for operation in the North Atlantic. She is expected to be ready to go into the regular liner service next spring. No pains will be spared to make this vessel one of the best cabin ships afloat. Safety appliances in particular will receive special attention and the BUCHANAN will be equipped in this regard similarly to the LEVIATHAN.

The New York & Porto Rico line stated May 14 that the contract for its new passenger and freight ship has not yet been awarded. The plans and specifications and bids submitted some time ago are still actively under consideration but the officials of the line do not anticipate that the contract will be awarded until late May or early June.

# Activities in the Marine Field

**Latest News from Ships and Shipyards**

# Ice Blockade Retards Lake Season

IN THE face of a heavy demand for its services, the Great Lakes fleet has reached the middle of May without ice conditions permitting full operation. The ice blockade between Lake Superior and Lake Huron, Lake Michigan and Lake Huron and at different ports, notably Buffalo, has been one of the heaviest ever known and practically has cost the lake fleet one month. On an average free navigation opens by April 25, giving a 7-month season. The vessels will have to move in 6 months the heavy freight tonnage which would have taxed their full season capacity. The whaleback steamers HENRY CORT and J. B. NEILSON were used to break through the passage into Lake Superior but continued cold and storms have repeatedly reclosed the channels through the ice in Whitefish bay.

Demand for vessel capacity is active and the three main bulk freight commodities, iron ore, coal and grain, are offered for carriage in heavy tonnages.

On April 21, the 600-foot bulk freighter WILLIAM H. WARNER was launched at the Lorain yard of the American Shipbuilding Co. for W. H. Warner & Co. and the Maher Collieries Co., with the Panda Steamship Co., G. A. Tomlinson, as manager. She is a sister ship of the other 13,000-ton freighters built at Lorain this year.

* * *

A number of minor accidents marked the opening of the new season. The steamer BALL BROS. went aground at Sandusky. The ALPENA went aground in the Detroit river while the steamer J. T. HUTCHISON was ashore near Midland. The steamers J. H. SHEADLE and W. H. TRUESDALE collided in Lake Erie while the steamer GRAND ISLAND struck the upper crib in the West Neebish cut. The M. A. BRADLEY collided with and sank the canal barge URSULA and damaged the barge BIRD. The sand steamer GEORGE W. PARKER sank in the Detroit river after colliding with the JAMES DAVIDSON. The WILLIS L. KING and SHENANGO collided at Ashtabula while the HOOVER & MASON and the THOMAS WALTERS were in collision at Duluth. The HARRY YATES struck the Black Rock lock while the JAMES LAUGHLIN went ashore at Squaw island reef. The W. H. TRUESDALE went ashore at Belle Island reef while the steamer SMITH THOMPSON was badly damaged by grounding on Squaw island reef. The W. P. SNYDER JR. and the GLENCHARD collided at Russel island in the St. Clair river. The tug LORENE went aground off Catawba island while the steam PHILIP MINCH struck the jetty at Ashtabula. In addition a number of vessels were damaged by ice.

* * *

Capt. C. Z. Montague died suddenly on board his ship, the steamer JOHN B. COWLE, on Lake Superior May 11. He had sailed the lakes for many years and since 1906 had sailed the steamers CHARLES HUBBARD, HARRY COULBY and JOHN B. COWLE of the Great Lakes Steamship Co. fleet.

* * *

The D. & C. Navigation Co. opened its Detroit-Buffalo season on May 15 when the big steamer CITY OF CLEVELAND III sailed from Detroit. The CITY OF BUFFALO of the C. & B. Transit Co. left Cleveland May 13 on her first trip and the CITY OF ERIE followed the next day. With the exception of May 15, 1921, this is the latest opening trip for this company in 20 years. The big SEEANDBEE will make her first trip on June 9.

* * *

The Dominion Marine association held its twentieth annual meeting at Montreal on May 11 and urged provision of better facilities for loading, storing and discharging cargo at Canadian ports. Protest was made against the arrangement proposed at Ottawa under which, it is claimed, American tonnage could enter Canadian coastwise trade.

* * *

The E. J. EARLING brought the first ore cargo to Erie on May 10.

* * *

Frank N. Gates has been made receiver for the Chicago Steamship lines. The company operates steamships between Chicago and the barge canal, leasing six vessels and owning one.

* * *

Annual meeting of the Lake Carriers' association, adjourned from January, was held May 17 at Detroit.

* * *

Steamer FORDONIAN was drydocked at Ashtabula for repairs, having 32 damaged plates. The HARTNELL stripped her steering gear on the first downbound trip. The GLENGARNOCK went aground in the St. Marys river.

* * *

D. Z. NORTON of the Columbia Steamship Co. has been chartered by the Michigan Limestone & Chemical Co. for a season's service in the stone trade between Calcite and Lake Erie ports.

* * *

The first vessels from the lower lakes reached Duluth May 5, the latest opening since 1904 when the first vessel did not get through until May 12. The average opening is about April 24.

* * *

Steamer MARY C. ELPHICKE was damaged in the ice above the Soo. The SINALOA went aground at Erie.

* * *

The PRICE MCKINNEY of the Hutchinson fleet reached Buffalo May 5 with the first grain cargo of the season. Within the next two hours, the JOHN STANTON, W. H. MCGEAN, J. J. H. BROWN and MARTIN MULLEN also made port.

* * *

The steamer J. L. REISS and W. A. REISS which loaded at Escanaba reached Cleveland May 5 with the first ore cargoes delivered at Lake Erie ports. The steamer O. M. REISS brought a cargo to Fairport.

* * *

Steamer CENTRAL WEST was the first vessel to arrive at the Soo through the ice field from a Lake Superior port, reaching there May 5.

* * *

The HARVESTER was the first vessel to reach Duluth this season while the steamer C. L. HUTCHINSON which came in a few hours later was the first loaded boat to arrive.

* * *

The sand steamer TRENTON capsized and sank in the Detroit river below Algonac on May 4. She was built in Buffalo, was 133 feet long and was owned by the Bradley Steamship Co., Detroit.

* * *

Dredging has started at Sandusky on extensive improvements in the bay near the docks of the Lower Lakes Dock Co. A full depth of 23½ feet will be given in the channel to the coal loading machines.

* * *

The Kelley Island Lime & Transport Co. has leased the Baltimore & Ohio railroad docks at Sandusky for a period of 50 years.

* * *

The annual meeting of the Great Lakes Protective association, postponed from January, was held May 3. Members of the advisory committee, J. S. Ashley, A. E. R. Schneider, John T. Kelly, C. L. Hutchinson, Harry Coulby, R. W. England, C. D. Dyer, H. K. Oakes, A. E. Cornelius, William Livingstone, and F. I. Kennedy, were all re-elected Chairman J. S. Ashley in his annual report, showed that 1922 was a successful season, the indicated excess in contributions for the year being $220.-357.87.

* * *

Capt. H. W. Thorp, president of the Goodrich Transit Co., operating also the Goodrich Transportation Co. on Lake Michigan, has arranged with the Manitowoc, Wis., Shipbuilding Co. to prepare plans for a passenger boat of a new type, which will be electrically driven. The vessel will cost about $1,000,000 and financing now is under way. The ship will be 345 or 360 feet long and contain 300 staterooms, having also space for automobiles, package freight, etc.

# Up and Down the Pacific Coast

PORTLAND, Oreg., interests have completed purchase of the American steel steamer EASTERN KNIGHT, 4156 tons. She will be delivered at New York, upon arrival from Calcutta, and will probably be used in the intercoastal trade. The same capitalists recently bought the steamer EASTERN SAILOR, a sister vessel, from the shipping board. The latter vessel was renamed PETER KERR, in honor of a Portland exporter, one of the purchasing syndicate.

* * *

Prince Rupert, B. C., is now considered a regular Pacific coast port of call. For the first time, a freighter, the Norwegian steamer BRATSBERG, arrived at Prince Rupert direct from Oriental ports to load outward cargo. In mileage, Prince Rupert is closer to Japan than any other port on the north Pacific, outside of Alaska.

* * *

The Canadian Pacific's transpacific liner EMPRESS OF CANADA, recently completed a remarkable run from Yokohama to Victoria, B. C. She made the 4220 miles in slightly under nine days and could easily have cut down the record run of the EMPRESS OF RUSSIA had she not slowed down so as not to arrive at quarantine in the night. The record run was established in 1914 by the EMPRESS OF RUSSIA with 8 days, 18 hours and 31 minutes. The best day's run on record on the Pacific was made by the EMPRESS OF CANADA on her recent voyage, in one period of 24 hours she having steamed 573 knots.

* * *

Illustrating the unprecedented amount of lumber being landed at San Pedro, Cal., from north Pacific ports, the arrivals at the southern California port have been averaging 35 lumber carriers a week with total cargoes ranging from 30,000,000 to 40,000,000 feet. This lumber is distributed by rail through California, New Mexico, Arizona and Texas.

* * *

The 4-mast steel barkentine ALTA, which sailed from San Pedro for Bellingham, Wash., Feb. 20, has been given up as lost. This voyage is ordinarily made by a sailing ship in less than 30 days and the disappearance of the ALTA is a complete mystery. Her crew consisted of 35 men and one woman.

* * *

Due to the keen competition of American steamers operating between Puget sound and the Orient, one of the Japanese lines has reduced its passenger fares $15. The American vessels have been showing a rapidly increasing passenger travel, they being especially popular between ports in the Orient.

* * *

The barge FRENSO was destroyed by fire while moored in Lake Washington, Seattle. In recent years she has been employed as a tender for the whaling stations in the Aleutian islands. In her early days, she was famous as a smart ship and established many records to various parts of the world. The FRESNO was built at Bath, Maine, in 1874.

* * *

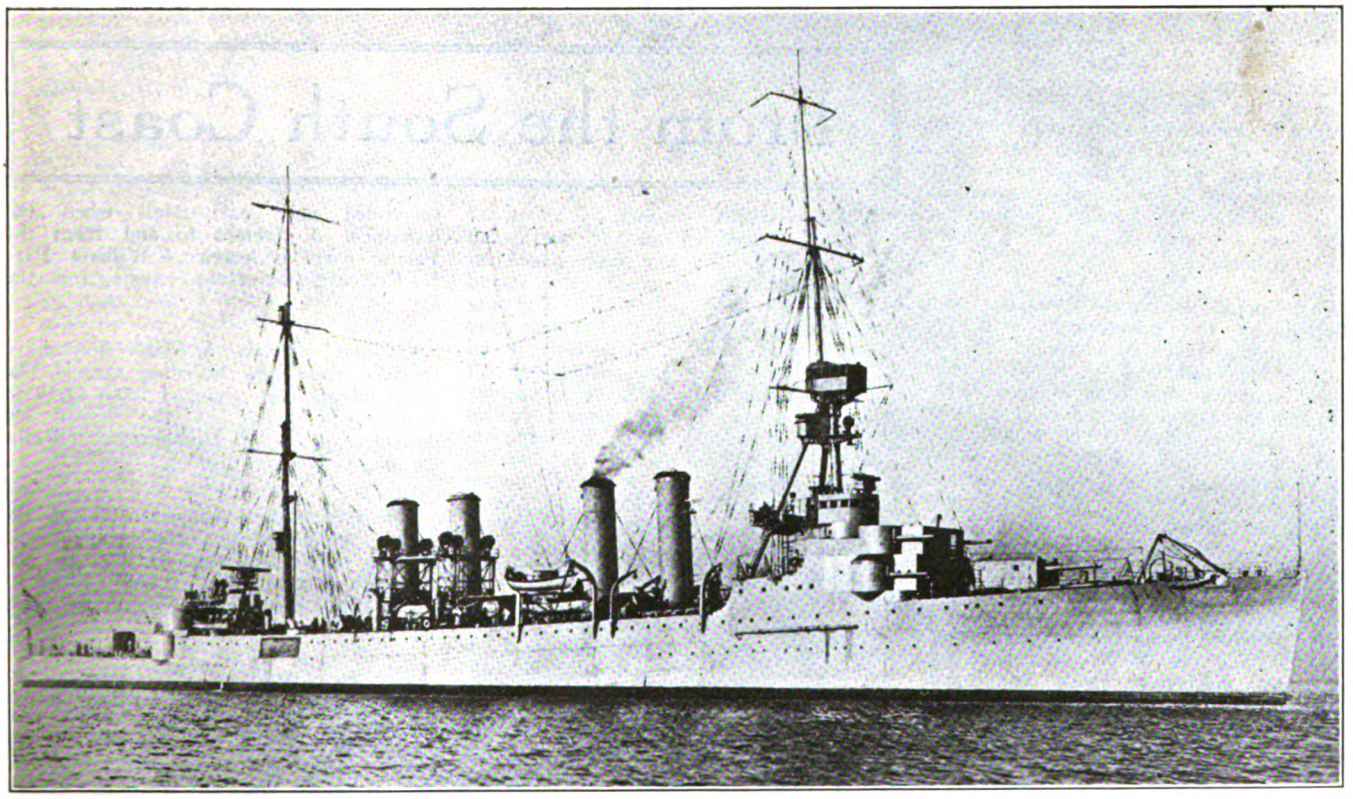
According to the annual report of the Pacific-Alaska Navigation Co., the holding corporation of the Pacific Steamship Co., the gross earnings from steamships, wharfage and other sources in 1922 amounted to nearly $10,000,000 as against $9,206,256 in 1921. The net operating earnings last year were approximately $1,000,000.

* * *

After being engaged in the lumber carrying trade between Puget sound and the Hawaiian islands for 34 years, the 4-mast wood schooner ROBERT LEWERS was wrecked on Vancouver island. The schooner broke adrift while in tow and was swept to destruction on a rocky shore. The crew numbering 12 were saved.

* * *

Built at Tacoma during the war, the 5-mast wood schooner LEVI W. OSTRANDER is to be sent to China where she will probably be used in coasting. The OSTRANDER was receently sold and will carry a cargo of lumber to Shanghai



UNITED STATES SCOUT CRUISER MILWAUKEE ON A RECENT TRIAL TRIP ON PUGET SOUND. HER RATED SPEED IS 34 KNOTS. SHE IS THE SECOND OF THREE CRUISERS OF SIMILAR TYPE BUILT BY THE TODD DRY DOCK & CONSTRUCTION CORP., TACOMA. THE U. S. S. OMAHA IS ALREADY IN SERVICE

Reported to have cost $300,000, the schooner is said to have been sold for $15,000. However, in the last five years she is said to have made heavy earnings for her owners.

* * *

Following collision with an inter-island steamer, the wood schooner MARY E. FOSTER went ashore near Honolulu and is reported a total loss. The schooner was carrying a cargo of lumber from Bellingham in which trade she has been engaged for more than 20 years.

* * *

Extension of the box shook market is indicated by signing of a contract for shipping 2000 tons a month from Puget sound mills to Australia. Previously, Singapore has been one of the largest importers of box making material but Puget sound manufacturers have recently developed a large demand in the Antipodes.

* * *

The steel steamer MERIDEN, registering 1353 net tons, has been purchased by the E. K. Wood Lumber Co. for the coasting lumber trade. This vessel was built at Portland, Oreg., during the war and recently has been operating to South America.

* * *

The Planet line, succeeding the old Green Star company, is the latest addition to the services operating on the intercoastal route. The new company announces its first sailing from New York for the north Pacific early in May.

# In the North Atlantic

A NEW commodity in the export trade from Norfolk, Va., left Hampton Roads about the middle of May when a shipment of 4000 tons of bauxite was loaded on the Norwegian steamers SORLAND and KNUT JART for delivery at ports in Norway. Each ship carried 2000 tons.

* * *

The Polish car parts movement from Norfolk to Danzig is rapidly approaching completion. According to Hasler & Co., 3000 more cars now remain at the army base. Each ship carries material for from 200 to 350 cars, and on this basis the transaction will be finished in July.

* * *

Fire insurance rates on certain portions of the Norfolk waterfront will be materially reduced as a result of the operation of the city's new fire boat. Tests have proved satisfactory. The vessel throws 32 powerful streams of water and has an auxiliary system of 8000 feet of hose carried by a motor truck ashore.

* * *

For Norfolk harbor $450,000 has been allotted by the government with the understanding that an additional $50,000 will be approved later if required. The inland waterway has been allotted $400,000 and the James river project $32,000. It is stated by Maj. D. D. Pullen, district engineer, that $50,000 of the $450,000 appropriated for Norfolk harbor will be used for repair of the Craney Island bulkhead. This constitutes the third step in the harbor development program for the fiscal year 1924, the first consisting of a complete survey of the Elizabeth river from the belt line to Hampton Roads and the second a complete cleaning out of the area surveyed, which was finished in April. The fourth and last part of the development program, widening the channel from 325 to 475 feet, will be started in July.

* * *

Imports of crude oil alone at Hampton Roads for the past four years is indicative of the increase taking place in imports of other commodities. Oil imports were 9,828,000 gallons in 1919; 13,880,000 gallons in 1920; 34,528,000 gallons in 1921 and 86,484,000 gallons in 1922.

* * *

In the first quarter of 1922 the total duty assessed at the Norfolk and Newport News customs houses amounted to $247,797.88. For the similar period in 1923, a total duty of $509,573.15 has been assessed, an increase of more than 100 per cent.

* * *

Iron ore, imported from Sweden, is to form an important commodity in the list of imports entering Hampton Roads for the current year. It is announced by the Fred P. Gaskell Co., freight broker, Norfolk, that the largest consignments of this product ever entering the port are already arranged for and, in some cases, actually on the way to the port. A total of 150,000 tons has been booked for shipment through Hampton Roads to Virginia blast furnaces. Two vessels, each carrying a cargo of 8000 tons, will arrive in Hampton Roads in May.

* * *

Regular cargo service from Hampton Roads, with a steamer sailing every other Friday, will be inaugurated by the Munson line to Havana, Cuba, on May 25. E. E. Palen & Co., Munson representatives, will continue to handle the general cargo business.

The steamers will load at the municipal terminal and discharge at the company's terminals at Havana. The Munson line has been operating a service from Hampton Roads for the past two years, but without regular sailings. Steamers have been placed on the berth when cargo offered, but the company now proposes to give regular service every two weeks.

* * *

The LEVIATHAN, it was planned early in May, was to leave Newport News, Va., for Boston on May 15 and go into the Commonwealth drydock at Boston on May 17. Wind and tide conditions would affect the time of her docking at Boston, but she probably would dock in the forenoon of May 17, around 10 o'clock.

* * *

The shipping board has assigned the steamer SALVATION LASS of 7825 deadweight ton to the Mississippi Shipping Co., New Orleans, for its Gulf-East Coast South American service.

# From the South Coast

THE British steamer, J. OSWALD BOYD, grounded on the north end Padre island, a low sandy island just off the Texas coast where she stayed for three days, April 9-11. The tug ST. HELIERS came to her assistance from Tampico and after 8000 barrels of oil were jettisoned, the tug pulled her off and towed her into port at Galveston. After a survey, contract was awarded to the Jahncke Dry Dock & Ship Repair Corp., New Orleans, for $66,000 for all repairs. The vessel is owned by the Petroleum Carriers, Ltd., Newcastle England, a subsidiary of the Pan-American Petroleum & Transport Co., Los Angeles.

* * *

The name of the American steamer LAKE GERA was changed April 2 to SOUTHLANDS. The vessel was recently purchased from the shipping board by the Lone Star Steam Ship Co., Galveston, and the change of name is in accordance with the company's plans of having all of its vessels named with the prefix, "South."

* * *

After the F. J. LUCKENBACH calls at Galveston on May 16, the Luckenbach service of two vessels a month will be suspended until early fall when the movement of freight to and from the Pacific ports is heavier. William Parr & Co. are Galveston agents for the line.

* * *

Customs officials at Galveston have received their new boarding vessel. The name having been changed from Q-14 to KALITA, in honor of the 9-year old daughter of R. W. Humphreys, collector of the Galveston district.

* * *

The largest red snapper catch of the season, amounting to 40,000 pounds was brought into Galveston April 9 by the schooner ARCAS of the Gulf Fisheries Co. The entire catch was taken from the Campeche Banks.

* * *

The army transport, ST. MIHIEL, arrived in Galveston April 6 from Cristobal with a number of officers and men who have served three years in the Canal Zone and who were sent to San Antonio, Tex., for discharge. While the ST. MIHIEL was at Galveston, the Sixtieth Anti-Aircraft battalion embarked for the first lap of its voyage to the Philippine islands. The ST. MIHIEL was to stop at New Orleans and thence to

New York where another transport would take the soldiers to the far east.

* * *

A $44,000 contract was awarded the Todd Dry Dock & Repair Co., Mobile, Ala., for the repair of the British steamer INVERLEITH. The contract was for reriveting the circular ballast tanks. The damage was done on the voyage from Amsterdam to Galveston when she encountered extremely heavy weather.

* * *

John Jacobson, owner of the dredge VELASCO is practically rebuilding the vessel and is installing a 300 horse-power diesel engine. A new 50-horsepower generator, a new motor for winding and one for cutting will be installed. When completed, the VELASCO will have a capacity of 150,000 yards per month and will be put to work dredging the channel and turning basin at Point Isabel, Tex.

* * *

On April 21, a trial was made of an oil spreading device invented by Harry W. Stocking, Galveston. After going several miles out to sea, an ordinary sea anchor was put over the side of the tug JOHN C. STUART. A steel cable 150 feet in length was used and to this cable was attached a flexible hose connecting with a tank of oil aboard the towboat and with the patented oil spreader at the drag end. As soon as the anchor was in place, oil was pumped through to the spreader and drifted back to calm the heavy seas from breaking over the deck of the vessel.

* * *

The wooden tank motorship, J. F. PENROSE, formerly owned and operated by the National Oil Co. out of Galveston was sold during April to the O'Boyle Lighterage & Transport Co., New York. The vessel will be towed to New York where she will be used to transport oil about the harbor. She is of 2807 net tons and has a cargo capacity of 30,000 barrels.

* * *

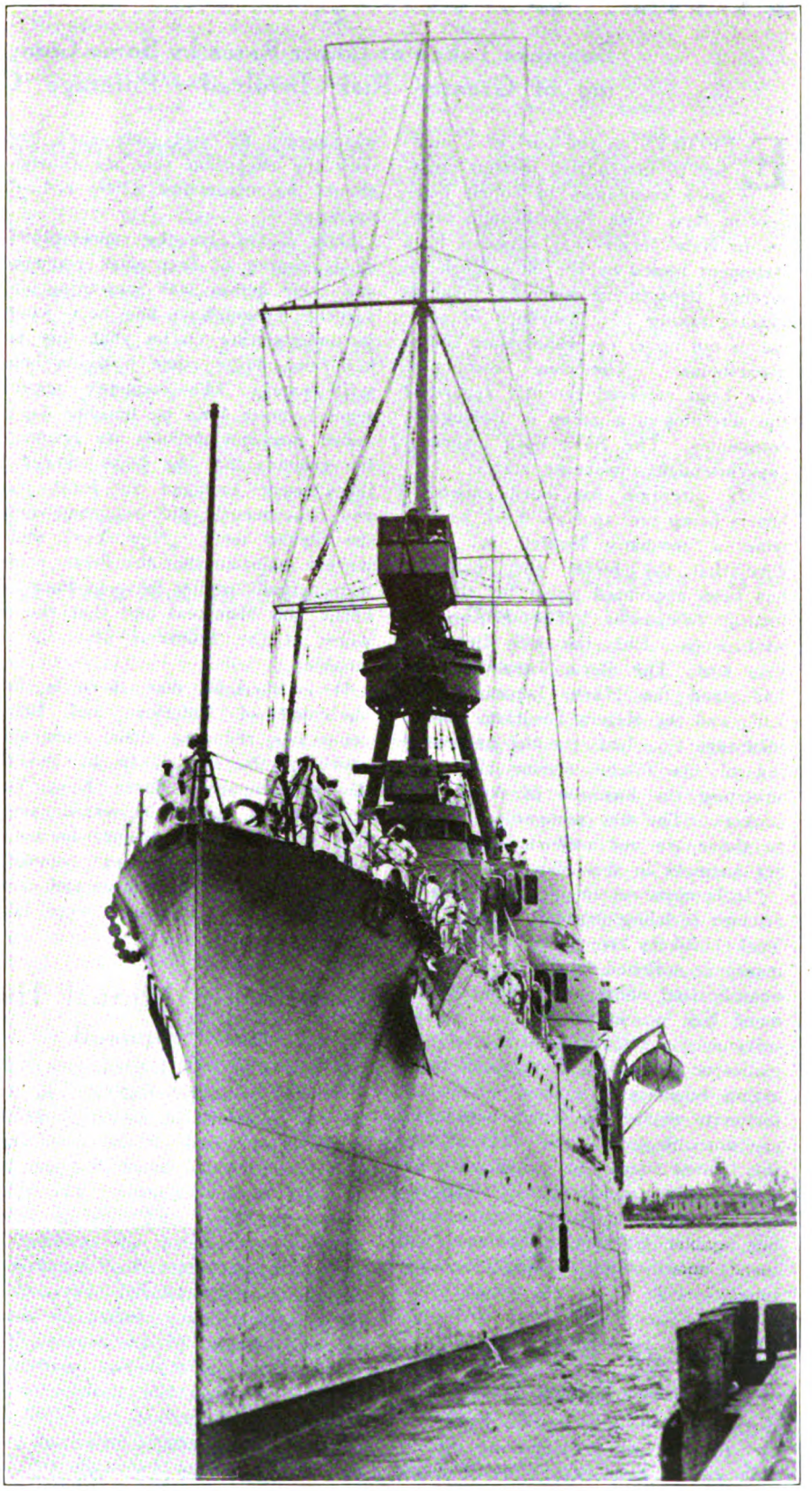
The British steamer ASHTABULA, 4327 net tons, arrived in Texas City, on April 19 where she loaded 55,000 barrels of gas oil for London, England. This is the initial shipment by the Marland Refining Co. through that port. Previously all of its exports were made through New York but now Texas City will be used both for foreign and domestic shipments.

* * *

Exports through the district of Galveston for the month of February, 1923, amounted to $34,323,804 against $19,050,763 for the same month in 1922, an increase of $15,273,041. One ninth of the exports of the entire United States were handled through that district. Japan was the largest purchaser with $8,233,693; Germany was second with $7,431,229; and England third with $6,931,840.

* * *

The Galveston Dry Dock & Construction Co. had to deal with a strike of machinists and laborers during the month of April. Although the machinists had been working for several weeks on the basis of time and a half for overtime instead of double time, they finally decided to walk out and the Mexican laborers walked out a few days later on the same grounds. No interruption or delay was encountered, however, as most machine shops at Galveston are on the open shop basis and with work scarce, new men were readily secured. The same was true with the Mexican labor situation, as negroes were engaged in their places.



U. S. S. SCOUT CRUISER OMAHA ENTERING THE HARBOR AT HONOLULU. SHE IS THE FIRST OF THIS CLASS COMPLETED AND PLACED IN SERVICE HER RATED SPEED IS 34 KNOTS. IT IS EXPECTED THAT A TEST OF HER SPEED WILL BE MADE ON THE RETURN TRIP TO SAN FRANCISCO AND SHE SHOULD BEAT EASILY THE RECORD FOR THAT 2200-MILE RUN NOW HELD BY THE H. F. ALEXANDER, FORMERLY THE GREAT NORTHERN, WITH 3 DAYS 18 HOURS 51 MINUTES

# Rate Cutting Is More Common

## Business Taken at Lower Rates by Some Companies Brings Warning of Greater Risk Involved — Pilferage Conditions Improve

EFFORTS on the part of a number of unadmitted foreign insurance companies to solicit business in New York state through brokers in New Jersey was revealed in a statement issued by the New York insurance department warning insureds against taking out insurance in companies not under the supervision of the department. Numerous complaints have been received recently regarding the activities of a group of Portuguese companies. The New York insurance superintendent's warning states:

"My attention has been called to letters being sent to New York brokers from a company located in Jersey City that the Jersey City company has been appointed agent for the following companies: The Futuro Insurance Co., Ltd., the Avis Insurance Co., Ltd., The Beria Insurance Co., Ltd., and the Marte Insurance Co., Ltd., and the Ketera Insurance & Reinsurance Co., Ltd., for the underwriting of fire inland marine risks and soliciting the business of New York brokers. The five companies referred to above are not authorized to transact business in this state.

"It is apparent in this case that an attempt is being made to induce New York brokers to place orders for insurance solicited in this city in these unauthorized companies. This department has no information as to the solvency or reliability of these companies or as to their methods of transacting business. In view of the unfortunate experience which policyholders, not only in this state, but all over the United States, have had with foreign unadmitted companies operating through agents in New Jersey, a warning against transacting business with these unauthorized companies seems timely."

* * *

## Canadian Firm Quotes Lower Lake Rate

LAKE hull underwriters have been thrown into a turmoil by the discovery that Dale & Co., leading lake underwriters in Canada, have been placing business on their books at rates said to be about 1 per cent less than those quoted by American and British competitors. The action of Dale & Co. followed almost immediately a committee meeting of lake underwriters in New York at which it was agreed to meet last year's basis, with the exception that no allowance should be made for $2500 reducible average.

Dale & Co. are the representatives of a number of first class companies and their action was something of a surprise although it has been known in underwriting circles that this firm has been doing some business below tariff rates. The company acquired several choice lines by quoting the reduced rate but defends its action on the grounds that the fleets insured by them were engaged in local trade and consequently did not come under the regular tariff. New York underwriters maintain that the fleets insured were actually plying between Port Colborne and Montreal and that the position of the Montreal office is untenable.

It is thought that there is little likelihood of American and British companies reducing their rates as a result of the step taken by the Canadian company. Some New York underwriters have expressed regret that Dale & Co. were not invited to participate in the recent committee meeting at which lake rates and conditions for the new season were taken up.

* * *

## Compulsory Mutual Hull Bill Proposed

AN INTERESTING glimpse of marine insurance conditions in Norway is contained in an article printed in the current issue of the *Scandinavian Insurance Magazine* which has just been received in this country. The article states that theft and pilferage losses have been reduced but competition among underwriters has resulted in premiums being reduced next door to nothing while policy clauses are altered in the disfavor of the underwriters. Policies are now being written in Norway, the magazine states, covering iron and steel against rust, split cod against all risks except mites and other deterioration caused by insufficient packing and drying and paper against all damage. It goes without saying that business done on such conditions is bound to disappoint the underwriters and to involve great losses, the magazine states.

It says that the startling feature on the subject of insurance law has been the government proposal of introducing a compulsory mutual hull insurance bill. Shipowners and underwriters have unanimously protested against this uncalled for measure and, the magazines comments, it is to be hoped that the government will abandon the idea in view of the fact that 22 mutual societies have voluntarily amalgamated into 10 societies which tends to better conditions on the Norwegian marine insurance market.

* * *

## Rate Cutting Brings Warning Note

AT LEAST three large companies writing marine insurance have attracted attention recently by accepting certain classes of business at rates below tariff and while as a body underwriters are unanimous against rate cutting they seem generally to vent their ire at committee meetings and upon their return to their own offices forget about it. There probably is not a single company that does not occasionally grant some kind of concession.

Marine underwriting during the past few years has not been an attractive field for capital, and while some companies were able to show an underwriting profit last year only the careful selection of risks made it possible. Writing business at a rate below that generally considered to be adequate may mean the temporary placing of premiums on the books but necessarily brings with it a higher loss ratio, which is just what the companies are trying to keep down.

In connection with the present underwriting methods, a man who is highly regarded in insurance circles for his many years of experience and the favorable showing of the companies which he manages commented on the fact that the young men in the business were the ones that were suffering at the present time, while the old underwriters doing their business conservatively, are holding their own. To bring home his point, this underwriter mentioned a number of names prominent in insurance offices and showed the individual records of their companies. In almost every instance, the old underwriter had steered his company through the bad waters while the younger men, who had done so well during the bumper years, have

run full into the submerged reefs.

The American marine insurance market is by no means the only one where rate cutting has become prevalent. It is not an infrequent event when London and New York do their best to undercut each other with the result that when the business is finally placed it is not worth having. A great deal of adverse comment has appeared in local circles regarding the writing on the New York market of a wrecking fleet at the rate of 1¼ per annum. It is reported that the fleet has been insured for a number of years at a rate approximately 5 per cent and the business has not been decidedly profittable. Just how the present underwriters can justify reducing the rate such a considerably amount, local insurance men are at a loss to explain.

* * *

## Want Protection On Grain Ship Loading

SOME months ago, an epidemic of Greek steamship casualties appeared which caused considerable concern among underwriters and talk of discriminating against Greek vessels. Conditions have changed and now it is Italian losses that are causing underwriters trouble. Lately there have been several Italian steamers bound for Europe that have become losses and underwriters have already started to cry for corrective measures. In at least one case, the vessel is held responsible because it carried grain on two decks during wintry weather when she was best fitted for taking on a general cargo that was not so susceptible to sudden shifting. In connection with the loading of vessels not equipped to carry grain, underwriters are protesting against the habit of steamers carrying such a dangerous cargo and are seeking some way to guard against these losses in the future.

* * *

## Germans Seek Safeguard Against Drop in Mark

FLUCTUATIONS in the value of the mark have naturally been the source of considerable inconveniences to German underwriters, who in order to protect themselves against further depreciation in the currency have inserted a clause, which reads, according to policies received in this country:

"In the case of controversy arising between the insurer and the insured which is settled before the courts or by arbitration, or in the case of payment on the part of the insurer being delayed by any reason, the insurer not to be liable to refund the assured for any damage accruing in consequence of the deferred payment, with the exception of legal interest, unless the insurer has acted negligently or wilfully in delaying such payment.

* * *

## German Cotton Rates Are Lowered

ADVISES from Galveston, Tex., received in New York, are to the effect that insurance rates on cotton in German ships bound for Germany have been materially reduced. Despite the cut, however, prevailing rates are still double those existent prior to the occupation of the Ruhr by the French forces. It is stated that the new rates are 25 cents for 15 days, including strikes and riots. For 30 days, the rate is 40 cents and for an unlimited time, 75 cents.

* * *

## Make New Ruling in Fraud Cases

A DECISION of unusual interest to marine underwriters because it is against the generally accepted principle that fraud voids the liability of a marine insurance underwriter has been handed down in a New York city court in the case of creditors against the Mechanics & Traders Insurance Co. in a loss where the insured was convicted of presenting false proofs of loss. Litigation was started by the creditors under bankruptcy proceedings and it was argued on their part that ignorance of the intentions of the insured to try to defraud the insurance companies should not bar recovery by them. The judge agreed with this viewpoint and emphasized it when he charged the jury.

The decision has been the subject of a good deal of comment among underwriters who fear that it may have a far reaching effect. One of the chief factors that insurance companies have had behind them in writing business is the good faith of the insured and the understanding that if misrepresentation is made the policy becomes null and void.

* * *

## Insurance Firms Stand Loss on St. Louis Fire

MARINE insurance companies will not be able to recover any part of the $2,000,000 paid by them to the International Mercantile Marine Co. on the loss of the St. Louis as a result of a decision handed down by United States Circuit Court Judge Ward in the southern district of New York in the case of the International Mercantile Marine Co. against the W. & A. Fletcher Co., Hoboken, N. J., for the loss of the St. Louis. Although they were not mentioned, insurance companies were the parties chiefly interested and had the suit brought to recover from the ship repair concern on the grounds that the loss was caused by negligence on the part of workmen. The insurance companies had paid the steamship company.

In making its decision, the court denied the allegation that careless use of a blow torch was responsible for the fire and held that the fire started in another part of the ship. The court also found that it was a condition of the agreement under which the work was taken that the ship repairing company should not be liable for losses ordinarily covered by marine insurance.

* * *

## Pilferage Losses Are Showing Decline

A CANVASS of marine offices has revealed the fact that theft and pilferage losses have been greatly reduced and that the situation in many spots hitherto looked upon as extremely bad have improved. Underwriters, of course, still maintain a black list of undesirable places but on the whole are satisfied with the improvement. Conditions have been improved through the co-operation of local authorities in most of the places blacklisted.

The American consul at Valparaiso in a recent report to the department of commerce states that Chile is doing its part to minimize the theft and pilferage evil. The Chilean customs ordinance has been amended to provide for a fine to be imposed on the captain of a vessel where cases are found to have been opened or their contents removed without the written permission of the customs authorities. In a recent case at Valparaiso 460 parcels of cargo were found to have been stolen before discharge and a fine of five pesos per stolen package was imposed upon the captain of the vessel. The fine was contested by the steamship company and was upheld by the Chilean supreme court which ordered the captain to pay the fine.

* * *

Much interest was aroused by the foreign trade convention held at Boston, May 17 and 18. The various phases of export trade were discussed at this meeting from different angles. Several division chiefs of the bureau of foreign and domestic commerce were present to enter into the discussion and to give counsel to the manufacturers.

## Career of Leviathan's New Commander

Capt. Herbert Hartley, commander of the MONGOLIA of the American line, has been appointed by the shipping board to command the LEVIATHAN. He recently began his new duties by joining the big ship at her outfitting pier at the Newport News Shipbuilding & Drydock Co., Newport News, Va., where he had every opportunity of becoming familiar with his tremendously complicated new charge.

Born in Oswego, N. Y., in 1875, Captain Hartley early indicated a desire to go to sea and at the age of 18 years joined the training ship SARATOGA as a cadet. During his two years of service on the training ship the young cadet had as instructors two ensigns of the United States navy, later well known as Admiral Sims and Captain Fletcher.

In 1895 at the age of 20, he entered the service of the American line as a cadet and continued with that line until his appointment to command of the LEVIATHAN. During his career as a cadet and as an officer he served on the ST. PAUL, ST. LOUIS, PHILADELPHIA, NEW YORK and KROONLAND. By far the greater time was spent on the ST. LOUIS in connection with which ship his record is probably unique in that he joined the ship at the time of her launching and remained with her until he attained the command, and in this post he remained up to and through the war.

Captain Hartley's war record is in line with his previous excellent record as an

# Ocean Freight Rates

**Per 100 Pounds Unless Otherwise Stated**

**Quotations Corrected to May 10, 1923, on Future Loadings**

| New York to | Grain | Provisions | Cotton (H. D.) | Flour | General cargo cu. ft. | General cargo 100 lbs. | ††Finished steel |
|---|---|---|---|---|---|---|---|
| Liverpool | 1s 9d | $0.35 | $0.20 | $0.17 | $0.30 | $0.60 | $7.00T |
| London | 1s 6d | 0.35 | 0.20 | 0.16 to 0.17 | 0.30 | 0.60 | 7.00T |
| Christiania | $0.19 | 0.40 | 0.40 | 0.24 | 0.42½ | 0.85 | 8.00T |
| Copenhagen | 0.19 | 0.40 | 0.40 | 0.24 | 0.42½ | 0.85 | 8.00T |
| Hamburg | 0.11 | 0.27½ | 0.25 | 0.17 | 0.37½ | 0.75 | 7.00T |
| Bremen | 0.11 | 0.27½ | 0.25 | 0.17 | 0.37½ | 0.75 | 7.50T |
| Rotterdam | 0.12 | 0.25 | 0.25 | 0.17 | 0.35 | 0.70 | 7.00T |
| Antwerp | 0.12 | 0.25 | 0.25 | 0.19 | 0.35 | 0.70 | 7.00T |
| Havre | 0.16 | 0.40 | 0.22½ | 0.23 | 0.40 | 0.75 | 8.00T |
| Bordeaux | 0.16 | 0.40 | 0.22½ | 0.23 | 0.40 | 0.75 | 8.00T |
| Barcelona | 0.21 | 0.60 to 0.70 | 0.50 | 7.00T | —16.00T— | | 10.00T |
| Lisbon | 0.25 | 0.75 | 0.50 | 7.00T | —20.00T— | | 7.00T |
| Marseilles | 0.21 | 0.55 | 0.50 | 5.60T | —20.00T— | | 5.00T |
| Genoa | 0.21 | 0.50 | 0.35 | 0.30 | 0.40 | 0.80 | 6.00T |
| Naples | 0.21 | 0.50 | 0.35 | 0.30 | 0.40 | 0.80 | 6.00T |
| Constantinople | 0.22 to 0.23 | 15.00T | 0.75 | 0.30 | —20.00T— | | 8.00T |
| Alexandria | 0.17 to 0.18 | 15.00T | 0.75 | 0.30 | —20.00T— | | 8.00T |
| Algiers | 0.22 | 0.75 | 0.75 | 0.30 | —20.00T— | | 10.00T |
| Dakar | ..... | 14.50T | ..... | 15.00T | —17.50T— | | 10.00T |
| Capetown | 12.50T | 17.00T | 17.00T | 12.50T | —17.00T— | | 12.50T |
| Buenos Aires | ..... | 20.00T | ..... | ..... | —20.00T—† | | 6.00T† |
| Rio de Janeiro | ..... | 21.00T | ..... | 7.00T | —21.00T—† | | 6.00T† |
| Pernambuco | ..... | 22.00T | ..... | ..... | —22.00T—† | | 8.00T† |
| Havana | 0.17½* | 0.37½* | ..... | 0.17½* | 0.47* | 0.94* | 0.20* |
| Vera Cruz | 0.20 | 0.30 | 0.35 | 0.20 | 0.52½ | 1.05 | 0.30 |
| Valparaiso | ..... | 1.07 | ..... | 0.70 | 0.45 | 0.80 | 12.00T |
| San Francisco | ..... | 0.35 to 0.40 | ..... | 0.56 to 0.75 | ..... | ..... | 0.30 |
| Sydney | ..... | 18.00T | ..... | 18.00T | 18.00-24.00 | | 9.00-12.00T |
| Calcutta | ..... | 16.00T | ..... | 13.00T | —16.00T— | | 10.00T |

T—Ton. †Landed. ††Heavy products limited in length. *Extra charge for wharfage.

| From North Pacific Ports to | Lumber Per m. ft. |
|---|---|
| San Francisco | $6.50 to 7.50 |
| South California | 7.50 to 8.50 |
| Hawaiian Islands | 10.00 to 10.50 |
| New Zealand | 14.00 to 16.00 |
| Sydney | 14.00 to 16.00 |
| Melbourne-Adelaide | 14.00 to 16.00 |
| Oriental Ports | 11.50 to 15.00 |
| Oriental Ports (logs) | 18.00 to 19.00 |
| Peru-Chile | 13.00 to 15.00 |
| South Africa | 19.00 to 20 00 |
| Cuba | 13.00 to 16.00 |
| United Kingdom | 80s to 90s |
| United Kingdom (ties) | 70s to 80s |
| Baltimore-Boston range | $13.00 to 14.50 |
| Baltimore-Boston range (ties) | 12.50 to 13.50 |
| Buenos Aires | 14.00 |
| **Flour and Wheat** | |
| Oriental Ports | $ 5.00 |
| U. K. and Continent | 32/6 to 37/6T |
| **General Merchandise** | |
| Oriental ports | $9.00 |
| **Steel** | |
| Oriental Ports | $5.00T to 7.00T |
| **Cotton** | |
| Oriental Ports | 35c to 50c per cwt |
| **Apples** | |
| United Kingdom | 90 cents per box |
| **Copper** | |
| Oriental Ports | $5.00 |
| **Box Shooks** | |
| Oriental Ports | $10 measurement ton |
| **Metal Junk** | |
| Oriental Ports | $10.00 |
| **Scrap Copper** | |
| Oriental Ports | $5 00 |
| **Salt Herring** | |
| Oriental Ports | $8 measurement ton |
| **Machinery** | |
| Oriental ports | $7.00 |
| **Automobiles** | |
| Oriental ports | $8.00 |

### Principal Rates To and From United Kingdom

| | s | d |
|---|---|---|
| Grain, River Plate to United Kingdom | 31 | 0 |
| Coal, South Wales to Near East | 13 | 0 |
| Coal, United Kingdom to Germany | 5 | 3 |
| Pig Iron, United Kingdom to U. S. Atlantic | 15 | 0 |
| Pig Iron, United Kingdom to U. S. Pacific | 27 | 0 |
| Coal, South Wales to Buenos Aires | 13 | 6 |
| Iron ore, Bilbao to Middlesbrough | 8 | 0 |
| General British market, six months time charters, per ton per month | 5 | 0 |

## Bunker Prices

### At New York

| | | Coal alongside per ton | Fuel oil alongside per barrel | Diesel oil alongside per gallon |
|---|---|---|---|---|
| April | 6, 1922 | $5.30 @ 5.90 | $1.16½ | 4.75 cents |
| July | 1 | 8.10 | 1.26½ | 4.75 cents |
| Oct. | 13 | 8.55 | 1.45 | 5.50 cents |
| Jan. | 11, 1923 | 7.90 | 1.50 | 4.75 cents |
| April | 11 | 6.75@7.50 | 1.76½ | 5.10@5.35c |
| May | 11 | 6.25@7.50 | 1.76½ | 4.65@5.65c |

### At Philadelphia

| | | Coal alongside per ton | Fuel oil alongside per barrel | Diesel oil alongside per gallon |
|---|---|---|---|---|
| April | 10, 1922 | $5.90 @ 6.25 | $1.05 | 4.25 cents |
| July | 1 | 8.00 | 1.15 | 4.25 cents |
| Oct. | 13 | 8.30 | 1.47 | 5.00 cents |
| Jan. | 9, 1923 | 7.30 @ 8 00 | 1.57½ | 5.00 cents |
| April | 10 | 6.00 @ 6.50 | 1.87 | 5.10 cents |
| May | 11 | 5.75 @ 6.25 | 1.85 | 4.90 cents |

### Other Ports

| | |
|---|---|
| Boston coal, per ton | $9.57 |
| Boston, oil, f. a. s., per barrel | $1.56 |
| Hampton Roads, coal, per ton t.i.b. | 7 00 |
| Seattle, coal, per ton | 7.50 to 8.50 |
| Cardiff, coal, per ton | 30s |
| London, coal per ton | 36s |
| Antwerp, coal, per ton | 37s |

officer. As commander of the ST. LOUIS renamed the LOUISVILLE, he, his officers, men and ship made a splendid record in transporting troops. His service in this respect was recognized by the award of the navy cross for exceptional devotion to duty and bravery. After the war, Captain Hartley continued as commander of various vessels for the American line and was in active service in command of the MONGOLIA in the New York-Hamburg service when he was selected by the shipping board to command the LEVIATHAN, the largest and finest American ship. He has, therefore, at the age of 48, reached the top of his profession as a sailor, and as any successful merchant marine is maintained quite as much by men as ships, it is to be hoped that his record and achievements will serve as an inspiration to American youth in choosing the sea as a career.

## Book Review

*Merchant Ships of the World*, 1923; cloth, 494 pages, 10 x 12½ inches; published by Sampson Low, Marston & Co., Ltd., London, and furnished by MARINE REVIEW for $20.00 net.

This book, which is the result of several years' work since the war by Frank C. Bowen, formerly a British naval officer, and F. J. N. Wedge, aims to give particulars of every seagoing merchant ship in existence of over 1000 tons register in such a form that the ship may be readily identified at sea. The book, which is the result of Captain Bowen's experience during the blockade of Germany, is divided into two parts, the first part giving the fullest available description of all ships alphabetically arranged under the names of the owners, while the second part is devoted to the identification of these vessels at sea.

In addition to printed data, the book contains thousands of illustrations of merchant ships reproduced from photographs, the aim of the editors being to illustrate the characteristics of every merchant ship afloat. In the case of sister ships, one illustration serves to depict a class of vessels, but in all cases where a ship has individual characteristics it is separately illustrated.

The printed data concerning each ship includes the registered tonnages, date of construction, speed, draft, deadweight cargo capacity, number of holds, height of 'tween-decks, number and dimensions of hatches, length, rise of floor, displacement, machinery details, bunkering capacity, daily coal or oil consumption, cargo handling gear, type and power of wireless, passenger accommodation, etc.

In the second part of the book, which includes 100 pages, the merchant ships of the world are classified according to their silhouettes in such a manner that practically any vessel can be identified. Beyond doubt this book contains an exceedingly large amount of information not hitherto published in a classified form and should be of value not only to navigators, but to engineers, naval architects, shipyards, drydocks, insurance interests, etc.

## Danish Marine Firm Is Solvent

A short article in the February issue of MARINE REVIEW referred to financial difficulties met by some of the Danish marine insurance companies. The firms which have failed are exclusively those started during the war while the solidity of the older companies founded before the war is practically unshaken. In that article, the Danske Lloyd, Copenhagen, Denmark was referred to as the latest company meeting financial difficulties. This statement was inaccurate since the company concerned was the Danske Atlas company. The Danske Lloyd company itself has not been involved, in any of the financial difficulties which have overtaken some of the Danish firms.

Among Danish companies, the Danske Lloyd ranks fifth in regard to age, having commenced operations in 1899. Among the members of its board are a number of prominent representatives from the industrial and shipping trades.

# Natural Cave Permits Placing of Light

EMPLOYES of the bureau of lighthouses, department of commerce, were compelled to borrow the tactics of radicals and bore from within in setting up a light on Sail rock, which is in the Virgin passage, West Indies between Culebra and St. Thomas islands. The rock, which rises 125 feet above the water and is unusually white because of deposits of bird guano, has long been a menace to navigation and was scheduled for an acetylene light showing a flashing white light of 150 candlepower.

But when the cargo boat of the lighthouse service tender LILAC attempted to make a landing on the rock it was found to be impossible. On every side the rock rose precipitously and seemed to present unsurmountable barriers. Finally, on the westward side of the island, guarded by reefs, a little bay was discovered, and this bay led to a cave 25 feet wide and 100 feet deep. As the lighthouse service bulletin states:

The latter rose in terraces back from the water, and to complete the perfection of a natural solution to the problem, the roof of the cave was provided with an opening leading to the upper

INSTALLING LIGHT ON THE ALMOST UNSCALABLE SUMMIT OF SAIL ROCK

shelf of the island. With the steady easterly trade winds, the little bay and cave between the reefs to the westward always offer shelter in ordinary weather while the sea dashes dangerously around the island. In the cave, the tank house was located. A ladder was erected up through the opening in its roof. The piping from the tanks in the tank house follows the ladder, then over the jagged rocks to another ladder running vertically up the face of the cliff, thence up over the peak to the lantern on the summit of the island, a total distance of 250 feet. The summit of the rock was leveled off and provided with a concrete platform to support a concrete pedestal and the lantern, and the whole is protected by a heavy wood handrail.

The concrete lantern pedestal was precast and weighed 1000 pounds. It was raised to the platform on the peak of the rock by a small **A** frame guyed back to the rocks. On account of the rugged character of the island and small working space all materials had to be handled in bags and the concrete hoisted in buckets to a height of 80 feet. A gin pole was rigged over the side of the cliff, which in calm weather facilitated landing most of the material. The balance was brought through the cave. The work was carried out by the crew of the LILAC without any mishaps. It was a dangerous and specatcular piece of work.

# Late Decisions in Maritime Law

## Legal Tips for Shipowners and Officers

**Specially Compiled for Marine Review**
**By Harry Bowne Skillman**
***Attorney at Law***

A CHARTERER of a vessel to carry a cargo of coal, who was excused by the charter party from demurrage for delay occasioned by strikes, is liable for delay in furnishing the cargo for the vessel, notwithstanding a strike on the railroads which were to transport the coal, where the strike was only partial and did not prevent the railroads from hauling more coal to the port than had ever been done before, so that the delay was caused by the unusual conditions in the coal industry, which were well known to everybody when the charter was made. "Charterers," said the court in Romney Steamship Co. v. Archibald McNeil & Sons Co., Inc., 273 *Federal Reporter* 287, "may not take advantage of their own mistakes in arranging for more shipments than can be promptly loaded."

* * *

A railroad company which covenanted to keep a pier leased by it to the United States in good repair to the satisfaction of the government officer in charge, took upon itself the task of vigilantly watching the leased premises, and thus became liable for injuries caused by an obstruction which it negligently failed to discover and remove. In short, it was decided in Chesapeake & Ohio Railway Co. v. Jones, 272 *Federal Reporter* 891, the company was bound to take reasonable care for the safety of vessels entitled to use the pier, and is answerable for a dangerous condition which was known to it, or which would have been known by the exercise of reasonable diligence.

* * *

An authoritative statement of the principles upon which compensation is allowed for salvage services, was said by the court in the case of Aslaksen v. United States, 273 *Federal Reporter* 241, to have been made in the early case of BLACKWALL, 10 Wallace 1. These principles the court excerpted as follows:

"Salvage services are viewed by the admiralty courts, not merely as pay on the principle of *quantum meruit*, or as remuneration for work and labor, but as a reward given for perilous services voluntarily rendered, and as an inducement to seamen and others to embark in such undertakings to save life and property. Public policy encourages the hardy and adventurous mariner to engage in these laborious and sometimes dangerous enterprises, and, with a view to withdraw from him every temptation to embezzlement and dishonesty, the law allows him, in case he is successful, a liberal compensation. That compensation, while liberal, should not be so extravagant as to encourage the presentation of unreasonable demands.

"The circumstances considered by courts of admiralty as the main ingredients in determining the amount of an award are the following: (1) The labor expended by the salvors in rendering the salvage service. (2) The promptitude, skill, and energy displayed in rendering the service and saving the property. (3) The value of the property employed by the salvors in rendering the service and the danger to which such property was exposed. (4) The risk incurred by the salvors in saving the property from the impending peril. (5) The value of the property saved. (6) The degree of danger from which the property was rescued."

* * *

In the case of Grimwood et al. v. Munson Steamship Line, 273 *Federal Reporter* 166, it appeared that plaintiffs contracted in writing with defendant to ship all their coal and coke from the United States to Mexico between certain dates by defendant's steamers and defendant agreed to furnish steamers to carry same. March 17, 1915, plaintiffs called for a steamer which defendant refused to furnish on the ground of chaotic conditions in Mexico. Suit was brought for breach of contract, and the court held that plaintiffs had proved no legally recoverable damages, because they had not shown that they had bought any coal in the United States for shipment to Mexico, or that they had sold any coal in Mexico to be imported from the United States. "If they had no coal to ship," declares the court, "they were not damaged by the defendant's refusal to supply tonnage. On the other hand, if they had coal to ship, they were bound to get other tonnage, and recover of the defendant the difference between the contract price and the price they had to pay. The measure of damages would not be the loss of profits from their coal business in Mexico, but the extra price which they had to pay for the tonnage not furnished." It having been shown that the defendant gave, as the only ground for refusal to furnish the tonnage, the chaotic state of affairs in Mexico, it was held that it could not, after suit brought, defend on the ground that the contract was not a requirement contract, but a wish, will or want contract, and that defendant waived breach of the contract by plaintiffs to ship all coal by defendant's steamers.

* * *

A bill of lading which is "clean," that is, contains no reference to the fact that goods shipped were laden on deck, and was issued by the ship's agents on behalf of the master and owners, imports under-deck shipment. Where a shipper executed a freight contract providing for deck shipment at ship's option, and knew that the goods were actually put on deck, the mere fact that by oversight on inadvertence a clean bill was issued would not entitle the shipper to recover for loss of the consignment. ST. JOHNS N. F., 272 *Federal Reporter* 673.

* * *

The case of HOUGOMONT, 272 *Federal Reporter* 881, is authority for the following: (*a*) The demand on the master by seamen for half of the wages to which they are entitled (United States revised statutes, section 4530, as amended by section 4 of the seamen's act), at an intermediate port, must be a reasonable demand plainly made, in order that the shipmaster may know exactly what is demanded of him, for, if he refuses half wages, whole wages instantly become due, together with possible damages; (*b*) seamen who, after their demand for half wages was refused, accepted payments from the master which amounted to more than the half wages due them, thereby waived whatever rights accrued from the demand; (*c*) seamen who voluntarily remained on the vessel, performing services and receiving wages therefor, after refusal of their demand for half wages, also waived their rights based on refusal of their demand; (*d*) in computing the amount of wages due, as to half of which demand may be made under the statute at an intermediate port, payments theretofore made to the seamen are to be deducted from the half of the wages which they are entitled to demand.

* * *

A seaman's contract is governed by the law of the country to which the ship on which he serves belongs, and the place where he shipped or reshipped is of no moment whatever. It follows, it was held in HANNA NIELSEN, 273 *Federal Reporter* 171, that the right of a seaman to cure and maintenance by the vessel after receiving injuries on board is governed by the vessel's nationality, and there can be no recovery for such cure and maintenance, when the vessel has complied with all requirements of the law of her nationality.

* * *

A covenant for the return of a chartered vessel in the same good order and condition as when originally delivered is implied in a charter party, it was pointed out in the case of Turney Transportation Co. v. National Dredging & Lighterage Co., 272 *Federal Reporter* 495. Citing an earlier decision, the court said that, while there is an implied covenant to deliver up a vessel at the end of the term, that covenant alone does not make the charterer an insurer, so as to hold him responsible for failure to return, when the boat has been lost or destroyed without his fault.

# Late Decisions in Maritime Law

## Legal Tips for Shipowners and Officers

**Specially Compiled for Marine Review**
**By Harry Bowne Skillman**
***Attorney at Law***

A COMMON carrier by water, not enjoying any public franchise or exercising any public powers or privileges, is not bound, after commencing to operate vessels over a certain route, to continue such operation, if it finds it desirable to discontinue and abandon the same. "It is true," declared the court in the case of Lucking v. Detroit & Cleveland Navigation Co., 273 *Federal Reporter* 577, "that common carriers, like railroad companies, which enioy peculiar rights and powers at the hands of the state, are not permitted to discontinue at will the rendition of the transportation services for the performance of which they have been endowed with such special privileges and powers." The reasons which underlie and prompt the imposition of such duty upon common carrier railroad companies, the court said, do not apply to common carriers such as the defendant. Continuing, the court observed that a common carrier such as defendant "holds no public franchise and enjoys no rights or privileges other than are held by any private individual desiring to engage in the business of transporting freight and passengers by water. It can not exercise the power of eminent domain. It has no private right of way or special facilities for acquiring means of access by its vessels to docks or wharves, but must use the open sea as its highway, and depend, for the proper maintenance of its vessels and equipment, upon such arrangements as it may be able to make by private contract, like any other private citizen. In the eyes of the law it occupies no different position than that of a common carrier operating taxicabs or other vehicles upon land, and it is under no greater obligation than is the common carrier last mentioned, so far as the continued operation of its lines is concerned. It has never been supposed, and could not seriously be contended, that every person who engages in the business of transportation as a common carrier is obliged to continue in such business indefinitely, and may be restrained by injunction from abandoning such of its routes as it may wish to discontinue. The mere fact, then, that the defendant is a common carrier, does not subject it to the duty to continue the operation of its vessels over any or all of its routes of transportation."

* * *

Interstate commerce act of Feb. 4, 1887. Section 1 (4), as amended by act of Feb. 28, 1920, making it the duty of every common carrier subject to the act, engaged in the transportation of property or passengers, to provide and furnish such transportation upon reasonable request therefor, requires that a common carier, subject to the act, which is actually engaged in transporting passengers or freight, must receive and carry such passengers and freight as may be offered to it, without discrimination, and does not prevent a common carrier by water from disengaging itself from the transportation of passengers or freight between particular points, nor does it make it the duty of such a carrier to furnish such transportation if it is not actually "engaged in" the business of furnishing any transportation between such points.—Lucking v. Detroit & Cleveland Navigation Co., 273 *Federal Reporter* 577.

* * *

Under a charter party providing that time for loading is to count from 72 hours after the master has given written notice of the vessel's readiness to load to the charterers or their agents, whether the vessel is in berth or not, the charterers, and not the owner, assumed the risks of delay in getting a berth. In order that contingencies specified in a charter party shall constitute a good defense to a libel for the charterers' failure to furnish a cargo, performance must have been thereby rendered in a practical sense impossible, illegal, or dangerous. It is not enough that the happening of one of them adds materially to the difficulties and embarrassment of the parties relying on it, if nevertheless it is still possible to perform.—Hellenic Transport Steamship Co. v. Archibald McNeil & Sons Co., 273 *Federal Reporter* 290.

* * *

An oral agreement to charter a vessel will not be enforced where the cargo owner inserted in the form of charter a new provision not covered by the oral agreement, and did not waive such provision, but sued upon the oral agreement as if it contained the new provision.—Lutz v. Douglass, 273 *Federal Reporter* 685.

* * *

Services rendered and material furnished and used in converting a war vessel, after sale by the navy department, into a fishing boat, were not rendered and furnished for a marine service, and hence a maritime lien therefor did not attach. Such a vessel, upon launching, it was held in the case of GEO. L. HARVEY, 273 *Federal Reporter* 972, was foreign to comerce and trade. "It did not receive, upon launching, a commercial or trade status," declared the court. "It was not subject to admiralty jurisdiction, and before she would be subject to admiralty she must be divested of the attributes of war, and clothed with the conveniences and necessities of commerce and trade. * * * The vessel was not registered, and had at no time embarked upon a mission of trade. It had not been fitted to function as intended, and whatever is necessary to qualify it to enter upon the commerce and trade is a part of the construction."

* * *

A vessel proceeding in a fog in frequented waters, at such speed that she can not stop within seeing distance of another vessel, is going at an immoderate speed and is at fault for a resulting collision, it was decided in ALBATROSS, 273 *Federal Reporter* 285. The court held also that a lookout should be given no other work which intereferes with that duty, and added that this is especially true on congested waters in a fog.

* * *

Lord Mansfield stated the rule a century and a half ago, that when mutual covenants go only to a part of the consideration where a breach may be paid for in damages, the defendant has a remedy on the covenant and shall not plead it as a condition precedent. This rule was applied by the court in the case of Trafikatiedolaget Grangesberg Oxelosand v. Ainesworth Coal & Iron Co., 273 *Federal Reporter* 215, where it was held that the breach by an owner of a ship of a provision in a charter party for the transportation of a cargo of coal giving the charterer the right to bunker the vessel did not authorize the charterer to cancel the charter party, but merely entitled it to recover damages for breach of that provision.

* * *

'In case of an obstruction deliberately placed in a navigable channel without giving any warning of it, the owners will be responsible to owners of vessels injured thereby while themselves exercising due care.—MAHANOY, 273 *Federal Reporter* 668.

* * *

Ferryboats, when operating in or close by the entrances to their own slips, have rights somewhat superior to those of other craft in the immediate vicinity. These rights, however, it was held in the case of HAZELTON, 273 *Federal Reporter* 815, are not greater than those reasonably required for the proper and efficient navigation of the privileged boats. They must maintain a sharp lookout for craft passing up and down the stream, and, once safely clear of rocks, are bound to navigate with respect to other craft in accordance with the rules of the road.

* * *

A supply man who knows nothing about a ship, other than that it is a ship in possession of those who order supplies for her, may furnish them upon her credit, without making further inquiry (in order to be entitled to a lien therefor), taking the chance—usually a remote one—that the possession of her was tortiously acquired.—ST. JOHNS, 273 *Federal Reporter* 1005.

# Business News for the Marine Trade

To be known as the Central Engineering Co., with headquarters at 35 Central Wharf, Boston, a new ship repair firm recently was organized with Ralph C. Christensen, formerly vice president and director of the Bertlesen & Peterson Engineering Co., as president. Associated with Mr. Christensen is R. L. Oliver, recently superintending engineer for John E. Emery & Co.

With a capital stock of $9,000,000, the Submarine Signal Corp. recently was incorporated in Delaware.

Capitalized at $250,000 the Montrose Steamship Corp., New York, recently was organized under the laws of Delaware.

The capitalization of the American Export Corp., New York, has been increased from $25,000 to $100,000.

Capitalization of the Niagara Ferry & Transportation Co. has increased its capital stock from $25,000 to $300,000.

The Palestine & Oriental Steamship Corp., New York, has been incorporated under the laws of New York with a capital stock of $20,000, by E. Rosen and J. and A. Haber.

The United States & China Steamship Co., Inc., has been incorporated with $12,000,000 capital stock to operate between New York and Far East ports. David L. Baumgarten is president of the company.

With a capital stock of $50,000, the Rotary Navigation & Transportation Co., New York, recently was incorporated by M. M. Miller and J. W. Ragley.

The Olympus Steamship Corp., New York, recently was incorporated under the laws of New York with a capital stock of $10,000 by W. S. Auld, J. J. Binder and S. Brander.

The T. A. Kyle Co., New York, shipyard, has been incorporated with a capital stock of $50,000 by T. A. and J. Kyle and G. L. Bergen.

A general lighterage business will be engaged in by the Florence B. Phillips Shipping Corp., New York, which was incorporated recently with a capital stock of $50,000, by J. Potts, E. C. Bould and G. Palmer.

The Russian-American Volunteer Fleet has been incorporated under the laws of Delaware with a capital stock of $10,000 by E. C. Barton, Martha Kobloff and Ralph F. Kane to operate boats of all kinds.

The Atlantic Wrecking Co., Victor M. Jarrett president and general manager, will establish modern facilities for dismantling ships at Baltimore. About $60,000 will be expended in clearing a site for the plant. The plant will have a capacity of four vessels.

The Sun Shipbuilding Co. has changed its name to the Sun Shipbuilding & Dry Dock Co. It operates a shipyard and floating drydock at Chester, Pa.

The sale of the 6000-ton steel floating drydock built by the Ramberg Dry Dock & Repair Co. to the Atlantic Works, Boston, recently was made by the United States shipping board. The buyer expects to tow the dock from Brooklyn, N. Y., to Boston where it will be utilized in drydocking work at that port.

The Montrose Steamship Corp. has been incorporated under the laws of Delaware with a capital stock of $240,000 to own and operate steamship, tec.

The Detroit Wharf & Warehouse, organized to handle docking, stevedoring and warehousing at Detroit, plans to handle only season contracts with lines and no tramp vessels will be accommodated.

With a capital stock of $250,000, the Booras Steamship Navigation Co., New York, recently was incorporated, by J. J. Binder, H. D. Frackman and S. Brander.

Capitalized at $10,000 the Steamship Supplies Co., New York, recently was organized by C. P. Kramer and R. E. Maken.

Commercial Freighters of New York, is the name of a new firm recently organized with $10,000 capital stock to engage in a general freight forwarding business, by J. Berbery, L. Mayerink and V. Fay.

The Atlantic Coast Shipbuilders' association will occupy new quarters at 1600 Walnut street, Philadelphia, starting June 1.

One of the largest international shipbuilding and repair organizations will be formed by arrangements whereby the New York Harbor Drydock Co., New York, will become associated with the firm of Swan, Hunter & Wigham Richardson, England. Combined with these two organizations by connections in a subsidiary way with the English firm, are the North British Diesel Engine Works and the John G. Kincaid & Co., Ltd., Greenock.

William Griscom Coxe, Bellevue, Del., has formed a company with a capital stock of $500,000 to engage in business as ship broker.

H. E. Moss & Co., Ltd., will place eight 10,000-ton vessels in the fuel oil trade from Los Angeles harbor to Liverpool, it is understood.

The Four Oceans Navigation Corp., New York, recently increased its capital stock from $500 to $15,000.

The Canal Transit Corp. recently was organized at Buffalo, N. Y., with a capital stock of $30.000 by E. G. Wilson, R. Hatton and F. E. Trombley.

The Union Steverdoring Co., New York, has been awarded the contract for all work loading and discharging vessels owned by the shipping board at Philadelphia.

C. H. Pearsall will be vice president and general manager of the new Colombian Steamship Co., Inc., which was recently formed. M. A. Kerwin will be traffic manager.

K. and F. Glassup and C. Ashman have been named as the incorporators of the Glassup Steamship Agency which was recently incorporated under the laws of New York with a capital stock of $5000.

The National Inland Waterways Corp. has been incorporated with a capital stock of $25,000 by F. H. Braddock, G. A. Vowinkel and John W. Black, Pittsburgh.

The Transit Forwarding Co. has been organized with a capital stock of $20,000 by E. B. and A. B. Black and D. L. Sprissler, Buffalo.

With a capital stock of $100,000 the Rajah Steamship Co., Brooklyn, N. Y., recently was incorporated by L. N. and J. A. Martin and P. J. Dobson.

The Region Line, Inc., has been incorporated under the laws of Delaware with a capital stock of $7,000,000.

The U. S. & Levant Steam Navigation Co., New York, recently was incorporated with $250,000 capital stock by J. J. Binder, S. Brandes and R. Frackman.

F. H. Hoffman & Co., New York, exporting importing, has been incorporated with $100,000 capital stock by H. and F. Hoffman and L. S. Keit.

The New England Steamship Co., has spent approximately $150,000 for electric trailers and other equipment for the expeditious handling of freight. J. H. Gardner is vice president of the company.

The Wallace Dry Dock Co., Vancouver, B. C., has been authorized by the Canadian government to start construction of a floating drydock, which will be 500 feet long. It will be built in two sections of 200 and 300 feet and will weigh 15,000 tons. Another section will be added later, it is understood.

## Business Changes

A NEW YORK office has been opened at 115 Broad street by the Atlas-Imperial Engine Co., Oakland, Cal. The office is in charge of O. D. Trieber.

* * *

The Bridgeport Brass Co., has removed its New York offices from the Woolworth building to the Pershing Square building on Park avenue. F. Morton Clark became district sales manager, effective April 16, succeeding Arthur J. Nelson, who has been made sales manager of the fabricating division at the main office of the company at Bridgeport, Conn.

* * *

Beginning April 1, James P. Robertson & Son, 111 West Jackson boulevard, Chicago, are general western agents for the Reardon Smith line.

## New Trade Publications

RECORDING EQUIPMENT—A small folder has been published by the Uehling Instrument Co., Paterson, N. J., in which the use of recording equipment in power plants is described. The folder points out the heat losses in the average power plant and how these are detected and remedied through recording equipment.

PIPE THREADING MACHINERY—Landis Machine Co., Inc., Waynesboro, Pa., has published a 76-page illustrated booklet in which pipe threading and cutting machines, pipe and nipple threading machines, chaser grinder and automatic die heads are described and illustrated. The aim of the catalog is to set forth the distinctive characterictics of the company's die.

GEARS—The Boston Gear Works, Quincy, Mass., has issued a 192-page illustrated catalog in which the company's various products are described and illustrated. These include gears of all kinds, steel bushings, sprockets and chains, universal joints, ball bearings, chain drives, etc.

TIER LIFTING TRUCK—The Automatic Transportation Co., Buffalo, has published a 20-page illustrated booklet in which a tier lifting truck is described and illustrated. This truck is essentially an electric elevating platform truck with a lifting or tiering device. It has a capacity of 4000 pounds and may be furnished in various weights. It raises a load in cantilever fashion on two uprights and may be started and stopped at any height. The lift is by means of a single oversize screw revolving in a large oversize bronze nut, carried in a trunnion and provided with an oil magazine. Maximum loads of 4000 pounds are elevated one foot in 12 seconds. To eliminate accidents, the truck is equipped with an automatic cut-out which operates when load reaches extreme high or low positions.